OCCASIONAL PAPERS

of the

British Columbia Provincial Museum

No. 11

The European Starling in British Columbia: 1947-1957

by

M. T. MYRES

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THE EUROPEAN STARLING

IN BRITISH COLUMBIA: 1947-1957

By M. T. MYRES

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INTRODUCTION

The European starling (Sturnus vulgaris Linnaeus), a member of the Old World bird family, Sturnidae, was introduced into North America at a number of different places at the end of the 19th century. The nearest of these to British Columbia was Portland, Oregon, where starlings were liberated in 1889 and 1892. However, no birds from this introduction are believed to have survived after 1902 (Cooke, 1925, 1928; Phillips, 1928; Gabrielson & Jewett, 1940).

The introduction from which North America's population actually derives (probably, entirely) was that of 1890 and 1891 in New York. From this locus the bird has been moving steadily west until it has reached the country west of the Continental Divide. The spread of the starling across the Canadian prairies is documented by Myres (1958). It appears that it took only about 55 years for the bird to reach the boundaries of British Columbia from New York, and it reached British Columbia only thirteen years after it first successfully penetrated southern Manitoba. The Rocky Mountain chain seems to have been no barrier at all to the passage of the species westwards. The processes by which the dramatic populating of the continent has been brought about will be the subject of a review by Myres (ms. in preparation).

It appears to be characteristic of the European starling that its population rapidly builds up in a new area of colonization to a point at which the species outnumbers most of the native birds in abundance. The peak breeding population is reached some 10-20 years after the first nests are found. Following this

the size of the population is readjusted, by some unknown process, and the starling then appears less in evidence. In some New England states the starling is now less abundant than it was twenty years ago when it was frequently reported to be the commonest species in many areas. The same decline in population size has been observed in the other member of the Family Sturnidae which has been introduced on this continent. The crested mynah or Chinese (or "Japanese") starling (Acridotheres cristatellus) which was introduced into Vancouver, B. C., about 1897 at one time roosted in large numbers in the downtown areas. Today its numbers have greatly decreased (Scheffer & Cottam, 1935; Scheffer, 1955).

The European starling was first recorded in British Columbia in the winter of 1946-47, though it may well have infiltrated here in small numbers in the previous two winter seasons. In the ten years since 1947 it has established itself as a common breeding species in the interior of the province, and as a common winter visitor to the temperate lowlands of the Lower Fraser valley and southeastern Vancouver Island. There are big winter roosts in Vancouver.

The starling can be a considerable nuisance to man when it occurs in large flocks in fruit-growing districts (e.g. Southern Ontario), or when it roosts in winter on buildings in cities, or in ornamental trees or amenity woodlands. Its habit of flocking as soon as the first brood is off in May means that it is wandering about the countryside all through the fruit-growing season. The effect of the accumulated droppings of thousands of birds in a roost (particularly in deciduous woodlands) is sometimes to kill the trees involved, and the shrubs and other plants below them.

Much research on the economic importance of the starling to agriculture in the United States was conducted in the first three decades of this century (e.g. Kalmbach & Gabrielson, 1921; Kalmbach, 1922). A study is at present being conducted at the Ontario Agricultural College along these same lines. The starling is omnivorous, and in its relation to insect pests is highly beneficial to man. Kalmbach & Gabrielson (op. cit.) concluded that it was more beneficial in this respect than any of the native birds of the eastern United States except the bluebird (Sialia sp.) and purple martin (Progne subis). Its detrimental effects in British Columbia upon orchards in the Okanagan valley may be expected to reach their maximum in the next ten years, after which the decline of population will probably reduce the species to one of lesser economic importance.

In British Columbia, the only agricultural damage attributable to starlings which has been reported to me is a single case of depredations by blackbirds and starlings upon standing sweet corn being grown for the fresh market by the Commazzetto brothers two miles east of Kamloops, per P. W. Martin (in litt., Nov. 18 & 26, 1957). Martin writes, "These depredations have apparently increased remarkably in the past two years coincidentally with the increase in the starling populations. I would hate to state that it is cause and effect, but certainly it is a coincidence."

Rather more serious, perhaps, than the immediate agricultural and other nuisance potentials of the starling, will be the ultimate effect of its arrival in British Columbia upon the native birds of the province. It is an aggressive hole-nesting species, and we may anticipate a reduction in some insectivorous species of birds which use the same nest sites, e.g., tree swallows (Iridoprocne bicolor), and even the flickers (Colaptes cafer) that make most of the holes used. Probably the most hard hit of these native species will be the mountain bluebird (Sialia currucoides), and there is not likely to be much recovery of the original population size in the bluebird. One species which may successfully resist the starling, and may even help to check its numbers, since they also nest in flicker holes, is the little falcon (Falco sparverius), known as the sparrow hawk or "kestrel." E. A. James-Veitch writes of two pairs of nesting starlings (in litt., Jan. 2, 1957) that "were molested continually by a pair of sparrow hawks that raided their nests." Various hole-nesting owls (e.g. Otus & Aegolius) may also be expected to prove a match for the starling.

Many control methods have been attempted, none of which have been really effective on account of the bird's high reproductive potential and adaptable behaviour. Probably the most important factor in our human adjustment to the advent of this bird in our midst (whether in the country or in the middle of town) will be the extent of our recognition of the existence of a natural readjustment of the population growth curve which will occur after the initial establishment.

In the eastern United States there has been much research on the distributional status of the European starling at various dates, and on its migrations, in addition to the work on its economic importance. In its native Europe the starling is migratory, and in western Europe there is a defined SW "preferred direction" in the fall and a NE preferred direction in the spring. However, in England the bird is resident. There is no evidence that the

populations introduced into New York were at first migratory, nor do we know from which part of Europe they originated (Myres, ms. in prep.) However, once they had begun to spread outside New York a migratory tendency was quickly established with a standard SW preferred direction in the fall (Kessel, 1953).

One way in which the early spread of the species is affected is by the habit of small groups of starlings of migrating with robins (Turdus migratorius), or with various of the Icteridae (blackbirds, grackles, orioles, cowbirds, and meadowlarks). In British Columbia starlings most commonly travel with Brewer's blackbirds (Euphagus cyanocephalus) and redwinged blackbirds (Agelaius phoeniceus), and less frequently with yellow-headed blackbirds (Xanthocephalus xanthocephalus). These species do not necessaily have a SW-NE migratory preference.

This review of the status of the starling during its first decade of residence in British Columbia came to be written as a result of a banding recovery. On June 1, 1955, the writer banded five nestling starlings in a nest in a flicker hole in an aspen tree at Westwick Lake, ten miles south of Williams Lake, B. C. On February 26, 1956, one of these five starlings, No. 553-14404, was found dead on the lawn of a house in the 2200 block of West 22nd Avenue in Vancouver, B. C., not far from the big roosts in the 1900 block of West 14th Avenue and neighbouring areas (Fig. 12). Mr. Ted Walker, who returned the band to the Department of Zoology at the University of British Columbia deserves our gratitude for his alertness in spotting the band and in returning it to us. It was later discovered that this was the first recovery of a banded European starling west of the Canadian Rockies or the Cascade-Sierra ranges of the Pacific states. The line of flight was SSW.

The only review of the presence of the starling in British Columbia before this one is a list of records prior to 1950 which was compiled and published by Kenneth Racey (1950). It was obviously important that the subsequent increase in population should be properly documented before the information regarding it was forgotten. I wish, therefore, to express my personal gratitude to Dr. I. McT. Cowan, Head of the Department of Zoology at the University of British Columbia, for his interest in seeing that the matter should be documented, and for his encouragement of, and support for, the work I subsequently did to review the spread of Sturnus vulgaris across Canada. This work was done during a period when I was enjoying research grants from Canadian

Industries Limited and The Worshipful Company of Goldsmiths' of London (England). Without their financial support, which I wish to acknowledge here, this work could certainly not have been so thorough.

In the final analysis, however, the paper could not have been written without the assistance of the many people listed at the end of the review, who answered enquiries about their observations of starlings in British Columbia. Without their interest the status of the species at various times in the last ten years could not have been estimated. Particular thanks are due to all those who have supplied information on specimens of Sturnus vulgaris in their private collections, or in public collections. I am particularly grateful to Mr. Leo Jobin of Kelowna (formerly Game Warden at Williams Lake, B. C.) for his co-operation in this regard, since included among his specimens are some of the earliest records for the province. I have listed all the specimens of starlings (of which I am aware) in an Appendix. Not only are these important in mapping the spread of the species, but biological features may prove of interest in the future, and a listing of them now will prove useful then.

During the compilation of sight records of the starling the following have made a special contribution, and I wish to thank them for this: Mr. Mervyn Ball, Dr. G. C. Carl, and Messrs. James Grant, William M. Hughes, Walter B. Johnstone, and Patrick W. Martin.

Finally a few remarks regarding the priority and validity of records: the argument can be raised that starlings could have been present in a district for some time before they were first recorded there, even years before. I do not in general believe this is true. Fig. 2 indicates that by 1949 starlings had been seen as far apart as Coleman, Alberta, and Francois Lake, B. C., and since that time the area covered has apparently expanded very little. While it is true that in the Interior of the province human population is very thin, all my correspondents have been personally recommended to me and have either been well-known Canadian naturalists, or have been English, or have been persons familiar with starlings as a consequence of having lived in eastern Canada or the United States. When these individuals first saw the bird in British Columbia, they were usually aware of the importance of the record. There is significance also in the following facts (1) that two of the five earliest records of the starling in this province are in the form of specimens which found their way into the

National Museum and the Provincial Museum. In the National Museum there is, however, no other starling specimen from this province, and in the Provincial Museum there are only two other starling specimens, although the bird has become in subsequent years an abundant bird here, (2) that when records did begin to be made, in 1947 and 1948, they were quickly followed by a much larger number of records, which implies either that man was becoming much more observant or that the population of birds was rapidly increasing, and (3) there is negative evidence to the same end, supplied by the fact that starlings were not sufficiently abundant in Alberta until 1944 for enough individuals to have penetrated into British Columbia and be seen and recognized before about 1946, by the few competent naturalists living within the vast territory involved.

THE FIRST OBSERVATIONS: 1947-1948

Munro (1947b) in reporting the first B. C. records at Oliver in January, 1947, wrote: "There are earlier but unconfirmed reports of starlings seen in the Cariboo Parklands, at Williams Lake and at Alkali Lake," presumably by Leo Jobin for Racey (1950) when reporting Jobin's earliest records of 1948 near Williams Lake, states that "he had occasionally seen starlings during the two previous years." Jobin himself when publishing the first nesting record of the species for the province, stated (1952) that: "For three years prior to 1948 I saw occasional birds I was sure were European starlings (Sturnus vulgaris) in the vicinity of Williams Lake...." It is probably safe to say, therefore, that a few starlings entered British Columbia in the winter of 1945-46, while the ones seen in January, 1947, must certainly have been within the province during the final months of 1946, unless they had arrived over the International Boundary only a few days before.

The first authenticated records, however, of the bird in British Columbia, were of birds seen in the late winter of 1946-1947 at two widely separated localities--Oliver at the lower end of the Okanagan valley, and Bella Coola on tidewater at the head of Burke Channel in the Coast Range. These, with records in 1948, are listed below:

1947

(1) Mr. A. J. Braun, the well-known taxidermist of Oliver, saw eight starlings on January 15, 1947, near Oliver

(Munro, 1947b; Munro & Cowan, 1947; Racey, 1950). Mr. Braun collected four of these individuals and Munro (1947b) says that all of them were mounted. Braun, however, informs me (in litt., Nov. 30, 1956) that: "I still have the first two (male and female) I shot, mounted under glass. Of the four, I mounted three. One was shot up badly. One is in the Victoria Museum." This last bird is also mounted and is still in the B. C. Provincial Museum (G. C. Carl, Director, in litt., June 27, 1956). These specimens are adequate proof of the arrival of the bird in this province during the winter of 1946-47.

(2) Three months later, Mr. W. E. Pearce saw two starlings in Bella Coola in March, 1947 (Godfrey, 1949; Racey, 1950).

These two records, almost 400 miles apart, suggest that starlings entered British Columbia (in small numbers) on a broad front. These and other observations before March, 1950, are plotted in Fig. 2. It will be noted that they are scattered almost as widely across the province as the observations plotted in Fig. 4.

1948

(1) The next observation of the starling was not made until a year later. On April 30, 1948, Leo Jobin, then Game Warden at Williams Lake, took an adult male starling near 150-Mile House, Cariboo Road (Racey, 1950; Jobin, 1952). Jobin (1952) writes further that: "a few weeks later, near the same place, a female starling was seen carrying grasshoppers into an abandoned woodpecker's nest cavity about 30 feet from the ground. It is not known whether the young were raised successfully." Only Racey (1950) states the exact site of this nest: Onward Ranch, four miles from 150-Mile House. The specimen taken on April 30 is No. 306 in the Jobin Collection (Jobin, in litt., Sept. 26 & Oct. 2, 1956).

The locality at which these records were made is in the heart of the Cariboo Parklands which is a major breeding area at the present time, and I think we must assume that from such nests as these, in 1948, the present extensive breeding population there probably derives, at least in part.

(2) In the fall of 1948, Jobin took another specimen (No. 426 in his collection) on November 26, at Williams Lake. This also is referred to by Racey (1950) and Jobin (1952).

(3) Only five days after the last record, about December 1, 1948, an adult female was found dead at Bella Coola; it was sent by Dr. J. E. Whiting (a brother-in-law of W. E. Pearce, who saw the birds the year before) to the National Museum of Canada in Ottawa (Godfrey, 1949; Racey, 1950) where it bears the number 33406 (Godfrey, in litt., Sept. 12, 1956).

Miss E. K. Lemon of Victoria informed me (in litt., Dec. 4, 1956) that she saw the starling for the first time in British Columbia "at Cloverdale in July, 1948" (no date). This would appear to be the first record for the lower Fraser valley. It is of interest to add at this point that Jobin did not record starlings nesting again until 1951, when he found a pair nesting in the Williams Lake stockyards.

After 1948 records of starlings become so numerous in the province that I have discussed them separately for 10 different regions. These regions, which are illustrated in Fig. 1, are delimited more by suitability for breeding of the starling, or by

Fig. 1. Regions of British Columbia for which starling records are discussed separately in the text.

natural gaps in the observational record, than as strict geographical entities. The records have been plotted on three maps, in three consecutive time periods: from Jan. 1947-Feb. 1950 (Fig. 2); from March, 1950-Sept. 1953 (Fig. 3); and from Oct. 1953-Dec. 1957 (Fig. 4), but the records are not cumulative, i.e., records appearing in Fig. 2 (or 3) are not included in later maps, Fig. 3 (or 4).

REGIONAL OBSERVATIONS

(1) The Region east of the Rocky Mountains (Peace River District)

There has been only one record in the British Columbian section of the Peace River country, based on two birds seen a mile north of Dawson Creek on the Alaska Highway on July 29, 1952 (J. Grant, in litt., Oct. 26, 1956). Soper (1949) did not observe any starlings in the Grande Prairie-Peace River region in 1944, and the first large-scale invasion of the Edmonton region of Alberta did not occur until 1948. This was reported by Dr. Wm. Rowan in the Edmonton Journal for May 1, 1948, and subsequently records of the spring of 1948 were received (in letters) from Glenevis, Sangudo, and Edson, west and northwest of Edmonton. J. Grant (in litt., Oct. 26, 1956) tells me he saw two starlings at Meadowview, Alta., on June 26, 1949. Also reported to Dr. Rowan, in letters which I have seen, were the following early records from the Peace River Country:

(a) Beaverlodge, Alta. "One pair nested in the Pool elevator at this point last summer. They returned this spring...." (A. B. Dixon, in litt., May 4, 1948).

(b) Spirit River, Alta. "I have seen one here. This morning I was up at the top of the elevator cleaning up the dust...." (J. R. McKenna, in litt., May 3, 1948). He caught the bird, and although he did not recognize it, he realized what it was from the description in the article in the Edmonton Journal. Its presence inside the elevator seems characteristic.

The next records were made in 1950. Barney Hamm reports (in litt., June 4, 1956) that the first report he had of the species in the Peace River region was from Clairmont, Alta., in the spring of 1950. Not until two years later did he find a nest, two miles south of La Glace, Alta. Godfrey (1952), however, had seen seven juvenals just out of the nest and being fed by an adult

on June 19, 1950, at Faust, Alta. On June 27 he saw an adult at Peace River village, Alta., and on July 10 he saw a juvenal there. On July 5 he saw an adult at Grimshaw, Alta., not far away, and eight miles west of Grimshaw saw two juvenals on July 25. At Mile 71, Mackenzie Highway, a specimen was secured on July 8, 1950, by S. D. MacDonald (National Museum No. 35656) from a flock of thirty birds, most of which were immature.

It seems that by 1950 breeding in the Peace River region was fairly widespread, and the first nests may well have occurred as early as 1946 or 1947. This is to some extent corroborated by the Bella Coola records (1947 and 1948), breeding in the Cariboo Parklands (1948) and J. C. Shelford's records (listed later) from the Francois Lake region between 1947 and 1950. If the southwest preferred direction of fall migration is taken into account, birds from the Edmonton region might be expected to reach the Kootenays, the Okanagan valley, the South Thompson valley, or Vancouver in winter, while birds reaching Bella Coola or Francois Lake are on almost a direct line from Grande Prairie or Dawson Creek. This is made clear in Fig. 2.

It is also possible, of course, that the birds seen in the Okanagan valley in 1947 may have entered the province from Washington state by travelling northwards up the valley. At best we can only surmise whether starlings first entered British Columbia (a) from the Peace River country, (b) by travelling straight across the Rocky Mountains between Jasper and Banff, or (c) through Washington. As will be discussed elsewhere (ms. in prep.) the rate at which the bird spread across the continent and into British Columbia was so rapid, that any (or all) of these three sources of origin for the first British Columbian records is equally possible. The fact that the earliest records are winter records, when combined with the known propensity of immature birds to wander in almost any direction before the period of the main fall migration, only serves to confuse the issue even more, and makes further discussion of it unprofitable.

Apart from these comments, nothing more will be said of the starling in the Peace River country, or to the north of it, in this paper. A full account will be presented in Myres (1958).

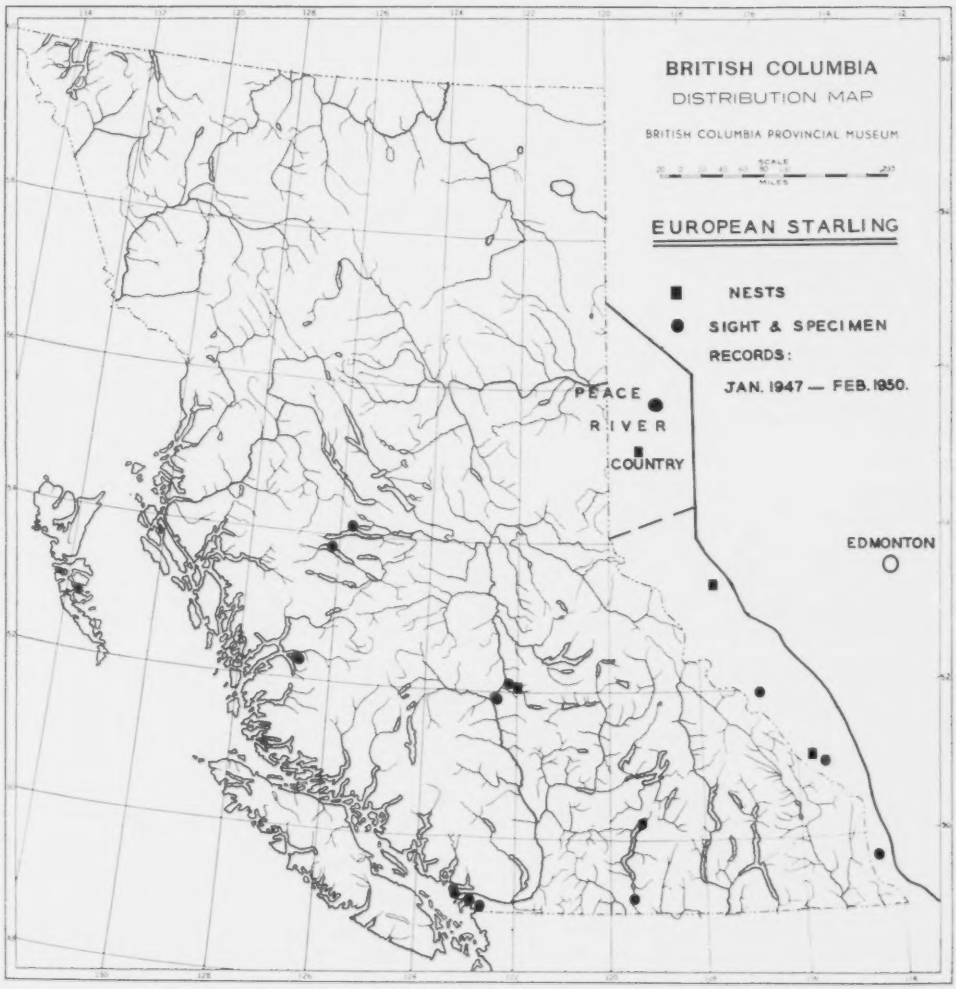

Fig. 2. Increase of the European Starling in British Columbia, from the first record in January, 1947 to February, 1950.

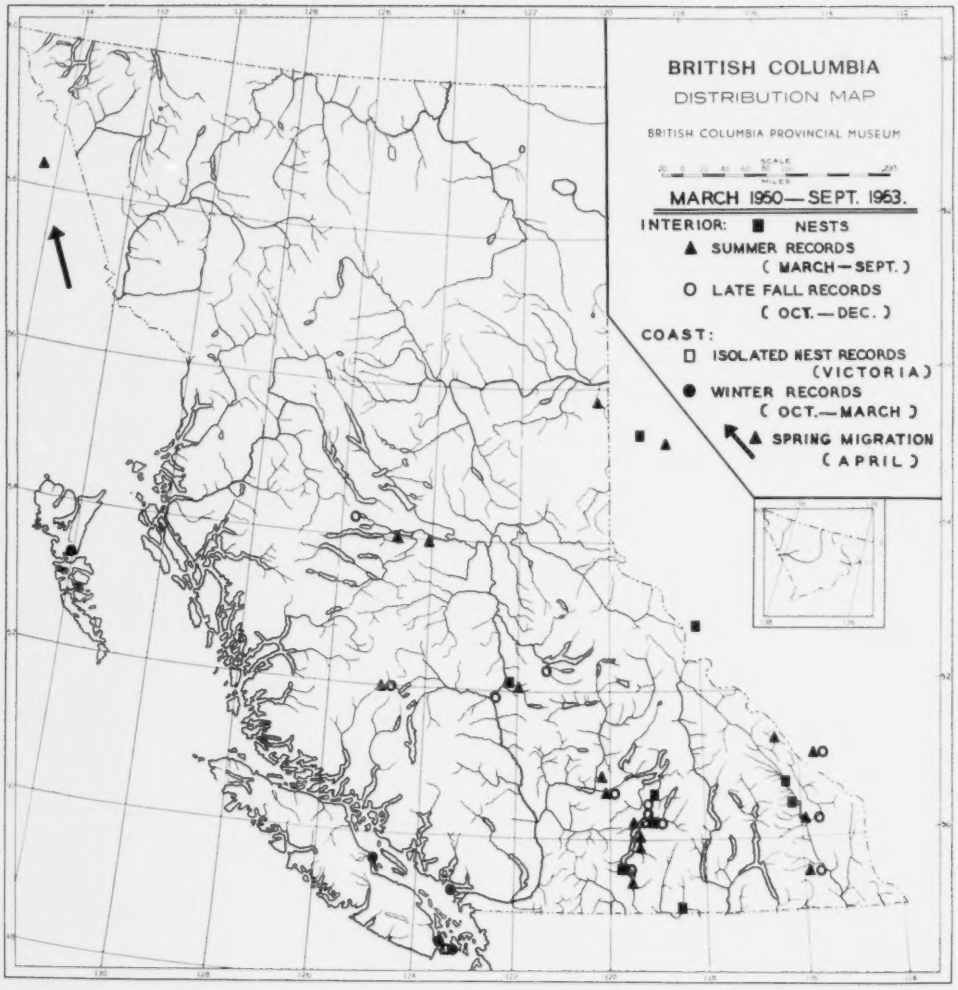

Fig. 3. Increase of the European Starling in British Columbia: records made between March, 1950 and September, 1953.

Fig. 4. Increase of the European Starling in British Columbia: records made between October, 1953 and December, 1957.

(2) The Rocky Mountain Region

Munro & Cowan (1944) working in the Kootenay National Park during June, 1943, did not see any starlings. Clarke and Cowan (1945) reporting on the birds of Banff National Park up to 1944 reported no starlings. Rand (1948) reporting work in 1945 in Waterton Lakes Park makes no mention of starlings. We thus have a fair body of negative evidence against the presence of starlings in the Rocky Mountains during the summers of 1943-45. Treating the Rocky Mountains as a meaningful region those records we have from regions of Alberta close to the British Columbia boundary will be reviewed here as being quite as significant as any that might have been seen not far west of the summit of the ranges.

The European starling was first seen in these regions in late March, 1948, at The Gap Ranger Station about 20 miles north of Coleman, Alta., a group of about six being seen (reported by D. Hereford to Grant, 1949). One was shot for identification. A. Dzubin (in litt., Dec. 11, 1956) states, however, that he did not remember having seen starlings in the Crows Nest Pass region of British Columbia, in the period 1947-1951.

Starlings were first recorded at Banff, Alta., on June 14, 1948 when James Grant (op. cit.) observed two birds in the buffalo enclosure gathering nest material: "Apparently this pair was successful in rearing their brood for I was told of a small group of starlings being seen in the same enclosure in August." Grant also found a dead starling in spring plumage near Seebe, 24 miles ESE of Banff on October 12, 1948. Thus in the spring of 1948 starlings were apparently "ranging along the eastern slope of the Rockies in increasing numbers" (Grant, op. cit.). The next record for the Banff National Park is of a bird picked up dead in the yard of the Warden station at Saskatchewan River crossing in the winter 1948-49. It was identified by H. U. Green (in litt., Oct. 13, 1956).

On April 8, 1950, Dan McCowan found an adult male dead on the golf links at Banff, and this bird is a mount in the Banff Museum (Banfield, 1953; T. E. Randall, in litt., Dec. 17, 1956; H. U. Green, in litt., Oct. 27, 1956). In June, 1951, two flocks, numbering about 20 each, were seen in the animal enclosure at Banff over a period of several days. A few days later a number of starlings were reported on good authority at Field, B. C., about 40 miles WNW of Banff (H. U. Green, in litt., Oct. 13, 1956). Banfield (1953) saw starlings in the Banff district on May 23, 1951, November 2, 1951, and April 21, 1952.

Since 1951 a few starlings, usually two or three together, have been observed by H. U. Green in the lower Bow valley within the Banff National Park, during the early summer months, but since he has no further nesting records, and none was seen after late July he believes (in litt., Oct. 13, 1956) that the birds he saw were migrating westwards. The starling, according to him, has not become established as a regular breeding species at Banff. He tells me (in litt., Oct. 27, 1956) that "there has been no general nesting activity of the starling at Banff or its immediate vicinity up to the present, although there are many available sites.... Neither has there been, to date, other than a transient occurrence...."

James Grant was the first to report starlings from the vicinity of Jasper (in litt., Oct. 26, 1956) for on May 29, 1949 he found a nest with young in open woods 1/4 mile from Entrance, Alta., some 55 miles WSW of Edson and only a few miles from the National Park boundary. He saw the parent birds. The interest of this nest lies also in that it was in a woodpecker hole in a living white spruce (Picea glauca). Cowan (1955) was working in the Jasper National Park during the summers of 1943, 1944, 1945, and 1946, but he saw no starlings. Banfield (1954) found the first nest inside the park in 1952, and wrote "starlings were first observed at Jasper on May 10, 1952. On May 21 a nest was discovered in a hole in an aspen...at Colin Creek...."

James Grant (in litt., Oct. 26, 1956) reports seeing starlings at McBride, B. C., in the Rocky Mountain Trench 45 miles NW of Mount Robson on two occasions:

(a) a flock of about 30 on October 14, 1955, and
(b) a flock of about 60 in September, 1956.

Thus starlings have been reported at various times since 1948 in the Rocky Mountain system in Alberta within a few miles of the British Columbia border: (a) near Coleman, 10 miles E of the border in March, 1948; (b) at Banff, 12-15 miles NE of the border as early as June, 1948; and (c) at Jasper, 12-15 miles NE of the border in May, 1952. Though breeding has occurred it has yet to be shown that it is regular or widespread in the valley floors of the Rocky Mountains. Breeding was first reported in the British Columbian section of the system, at Brisco only 40 miles SW of Banff, in 1950 (see next section).

There is strong evidence from other sources that in mountain regions lower levels are colonized as breeding range some

years before the higher levels. Thus T. D. Burleigh (in litt., July 24, 1957) writes of the starling in Idaho:

> As might be expected it first occurred in greatest numbers at the lower altitudes, and at Lewiston, Nez Perce County (altitude 860 feet) was common and nesting several years before it appeared at the higher altitudes. This past June I noted breeding pairs in...Fremont County, where the altitude is approximately 6500 feet. This is probably the highest altitude the starling will reach in Idaho, for suitable habitat, farms and cultivated fields, does not exist on the higher thickly wooded mountainsides.

It must be observed that breeding at such high levels in British Columbia is not likely, since the limits of cultivation in British Columbia very seldom reach even as high as 4500 feet, and most of the main breeding areas in the interior are between 1000 and 3500 feet. Fremont County, it should be added, is as far below the International Boundary as Jasper is north of it. Both at Banff (4538 feet) and Jasper (3470 feet) the valley floors are filled with forest, except where cleared. Thus the possibilities for breeding in cultivated areas at these altitudes are limited in this province, except perhaps on the dry eastern slopes which are in the rain shadow of the various ranges concerned. Here thinner forest growths may provide sufficient openings for the birds to penetrate to higher altitudes in some places.

At higher altitudes yet, above tree line, in the region of 5000 to 7000 feet, there are the alpine meadowlands. These provide, I believe, the open conditions which seem to be characteristic of starling breeding range whether natural or man-made. On eastern slopes these may well intergrade through drier forests to cultivated areas or parklands lower down, but whether starlings ever visit the meadowlands on the more exposed western slopes is doubtful, except perhaps during migration. We can only conjecture at the present whether these areas in the Rocky Mountains, ranges of south-central British Columbia, and the Coast mountains will ever be occupied by breeding starlings. It would seem doubtful.

(3) The Kootenay Region

On the grounds of geography one might have expected that the first breeding of starlings in British Columbia should have been in the southeastern portions of the province. However, the

general altitudes in this region are high, and the valley bottoms at lower levels are narrow. Settlement is somewhat scattered. On the other hand this is the only part of the province, apart from the Okanagan and South Thompson valleys, where the Dry Forest Biotic Belt (Munro & Cowan, 1947) penetrates into British Columbia. It does so along the Rocky Mountain Trench nearly to the vicinity of Brisco, and the parkland of Pinus ponderosa and associated trees provides a very suitable habitat for the breeding of the starling.

The chief ornithological authority for this region is Walter B. Johnstone of Canal Flats, between the headwaters of the Columbia River and the Kootenay River, some 75 miles almost due south of Banff.

Johnstone (1949) omits any mention of starlings, and he informs me (in litt., Dec. 12, 1956) that he first saw starlings in March, 1950. On March 8, he collected a female (No. 374 in the Johnstone Collection) from a group of three birds seen on a garbage dump in Canal Flats. He adds that this bird was in breeding condition and that its stomach contained particles of egg shell (domestic hen's). Four days later, on March 12, he again saw starlings, a pair, in Cranbrook. In May, 1950 (under date May 14) it was reported to him on good authority that a pair of starlings were nesting in the vicinity of Brisco, about 50 miles NNW of Canal Flats in the Rocky Mountain Trench.

The starling was seen in both spring and fall of 1951, but there were no reports of nesting. In June (as mentioned earlier) a party of starlings was seen at Field, 40 miles NNW of Brisco. On October 23, 1951, James Grant (in litt., Oct. 26, 1956) saw six starlings (and collected one specimen) at a horse corral about one mile below the confluence of the White River with the Kootenay River, above Canal Flats.

Mr. Johnstone's records of the species from 1951-1953, and in 1956 are listed in Table 1. It will be observed that in 1952 at least six pairs were reported, on good authority, to be breeding at Brisco. D. A. Munro, who spent the field seasons 1948-1953 working in the upper Columbia River valley, informs me (in litt., Aug. 16 & Oct. 19, 1956) that he did not see any starlings before the summer of 1952. On May 10, 1952, he observed three adult starlings at Invermere, midway between Brisco and Canal Flats... "in semi-open aspen groves near a slough. One adult was observed carrying a worm or caterpillar to a hole ten feet up an aspen. Young were heard calling from within the nest." Munro

did not observe any more starlings in 1952, but in 1953 he told Johnstone "that many pairs were nesting in the vicinity of Brisco, and that they are firmly established as a breeding bird there." (Johnstone, in litt., Dec. 12, 1956) Glen Smith came to the Kootenays in 1954 and tells me (in litt., Dec. 10, 1956) that "on several occasions in the past two years I have seen this bird in the Windermere area, at Invermere, Brisco, and Parson." A. Gissing who had seen starlings on March 25, 1956, summer of 1957 (nesting), and on November 17 and 19, 1957, at Brisco, tells me (in litt., Nov. 24, 1957) that in 1957 he saw a starling "carrying nest material across the highway a mile or better north from here when I was going to work in the mornings.... I am fairly certain they have now spread as far north, if not beyond, the Spillimacheen area" which is a few miles north of Brisco.

At Cranbrook on the west side of the Kootenay River on its southward journey, about 45 miles south of Canal Flats, the starling was certainly present in 1951 (Table 1) and G. Smith (in litt., Dec. 10, 1956) tells me that the starling is now common in small areas about Cranbrook, and have been reported for about two years at Creston.

Creston is situated 45 miles SW of Cranbrook across the Selkirk Mountains, and is on the Kootenay River on its northward journey towards the southern end of Kootenay Lake. The town lies only a few miles from the International boundary. The Kootenay River valley here is quite broad. Munro (1950) made surveys in this region in May of 1947 and 1948, and in the fall of 1947, 1948, and 1949, but he makes no mention of starlings in these years, but Munro (1958) includes the following: "According to local reports the first starlings appeared at Creston in 1955." In 1956 he observed starlings frequently in Creston and on the Kootenay Flats. He found a nest, containing young, near the shore of Duck Creek Channel on May 28. Twice in the first week of June he saw a flock of 30 birds ± "flying from place to place in the nearby marsh." The J. A. Munro Collection has two specimens from the Creston region. One is an adult female (breeding) taken on May 27, 1956. The other is a full-grown juvenile male, taken on July 11, 1956.

We may conclude, therefore, that the starling did not appear in any numbers in the Kootenays until 1951, but that breeding was reported in the first year that they were recorded in the Rocky Mountain Trench, 1950. On the other hand, D. A. Munro apparently did not observe them there until 1952, when they were again

nesting at Brisco. At Creston, and in the Kootenay Flats vicinity, starlings evidently did not become noticeable until 1954 or 1955. By 1957 starlings were evidently well established as a breeding species at Brisco, Cranbrook, and Creston. Johnstone writes (in litt., Dec. 12, 1956) that "an investigation would doubtless turn up other breeding areas in the East Kootenay." He states that there are as yet no records of starlings wintering in this region.

TABLE 1

W. B. JOHNSTONE'S STARLING RECORDS

1951, 1952, 1953, & 1956

1951.	March 20	Cranbrook	Six seen in company with Brewer's blackbirds.
	March 30	Cranbrook	Eight counted.
	April 3	Cranbrook	Three.
	October 15	Cranbrook	Fourteen on telephone wires in company with Brewer's blackbirds.
1952.	April 24	Brisco vicinity	Thirty-two counted.
	June 10	Brisco vicinity	Several flying about. One pair accompanied by three young.
	June 22	Brisco vicinity	Reported on good authority that at least six pairs nested.
1953.	April 22	Brisco vicinity	D. A. Munro reported that many pairs are nesting, and that they are firmly established as a breeding bird.
	October 14	Cranbrook	Large flock (estimated at forty).
1956.	March 26	Cranbrook	Possibly forty mixed with Brewer's blackbirds.
	May 22	Brisco	Reports of "many pairs nesting."
	October 10	Cranbrook	Probably over a hundred on lawns in the residential district.

(4) The Okanagan Region

I shall include in this area, along with the Okanagan valley proper, the districts around Grand Forks, Merritt, and Kamloops. Grand Forks is 90 miles west from Creston along the International Boundary, and 120 miles separate the Okanagan and Kootenay Lakes systems. There are quite certainly more records of starlings in this region than in any other part of British Columbia, which is in part due to the greater human population of this southern part of the Interior of the province. However, the open nature of the Dry Forest Biotic Area and the extent of human alteration of the environment to suit man's needs has also certainly resulted in a greater breeding concentration of starlings in this region than in any other, with the possible exception of the Cariboo Parklands.

The first record of the species in this region was also, as already mentioned, the first for the province. A. J. Braun collected four birds from a flock of eight birds seen near the International Boundary at Oliver on January 15, 1947.

According to Racey (1950) a flock of starlings was seen at Vernon in mid-November, 1949. Munro (1953) elaborates this record in more detail; November 12, 1949, about 21 starlings were seen near Okanagan Landing by Hoyes Lloyd and Munro. In October, 1950 (from October 4-11) a maximum of four were again observed at Okanagan Landing (Munro, 1953). In November and December, 1950, James Grant of Vernon observed starlings on two occasions: (a) November 12, 1950, Otter Lake near Armstrong, about 20 eating chokecherries (Prunus demissa), (b) December 15, 1950, Middleton's Ranch one mile south of Vernon, five. But none were observed in the Christmas Bird Census at Vernon on December 24, 1950 (in litt., Oct. 26, 1956).

The first summer record from this region comes from S. J. Darcus (in litt., Feb. 4, 1957) who tells me that he saw the first starling in Penticton in June, 1950 (five birds on a lawn).

In 1951 James Grant (in litt.) saw starlings on only one occasion; a single bird observed on the Christmas Bird Census at Okanagan Landing on December 30, 1951 (Table 6). Eric M. Tait of West Summerland "first noted this bird here in the winter of 1951-52 when seven birds were seen several times" (in litt., Nov. 27, 1956).

It was not until 1952, therefore, that starlings appeared in any abundance in the Okanagan valley, and the first breeding record (one nest, 1952) was some years later than the first in the Rocky Mountain Trench or the Cariboo Parklands. All dated records from 1952 to the end of 1956 are listed in Table 2 and Table 3. The fact that all records from 1947-1951 (inclusive), (with the exception of one in June, 1950) are from the winter period, October-January, is just one more confirmation of the pattern reported from other areas which, at various times across the continent, have bordered the breeding range. Already during the period 1947-1951 a small number of birds had been breeding at scattered points throughout the province: 150-Mile (1948), Williams Lake (1951), and Brisco (1950), but evidently during the winter of 1951-52 there was a further invasion of the province from Alberta. The increase in the number of summer records during 1952 and the greater increase in 1953 indicate that many of these migrants did not return, but stayed to breed in British Columbia.

Perhaps the clearest way to illustrate the increase in population of starlings in the Okanagan is to quote from the various informants who have sent me their impressions of this process since 1953. The extracts are arranged from south to north up the valley, beginning with the Penticton-Summerland area, and followed by the Kelowna and finally Vernon areas.

(a) A. J. Braun, Oliver. Since the first record in 1947 "the largest flock I have seen was in October, at least 100 in the flock."

(b) L. J. Bettison, Oliver. "I have seen a flock of about 20 birds off and on in my orchard....so far they do not seem to care for the house chimneys here as in England, and trees with holes in them are scarce....all the nests I have found in England have been in holes, crevasses in stone walls, and old buildings."

(c) E. M. Tait, West Summerland. "I first noted this bird here in the winter of 1951-52 when seven birds were seen several times. Each year since then they have been increasing. This fall (1956) a flock of about sixty to seventy birds was noted. Since early fall, however, they have not been noted by me. I first noted them nesting here in the summer of 1953 when a pair was seen carrying nesting material. In the summer of 1955 I picked up a fledgling starling on our lawn; it was just out of a nest, as it was barely able to fly."

(d) S. J. Darcus. "I first saw the starling in Penticton in June, 1950, five birds on a lawn. Now it is well established in the district and breeding, also wintering. At Summerland it appears to be more common as on several occasions in the past three years I have observed quite large flocks there in winter, but I have no evidence of it nesting there. Last season (1956) I found three nests in Penticton in old flicker's nesting holes. I estimated there might be about 20 breeding pairs in the area. There it has become a permanent resident."

(e) B. Chichester, Rutland. "I believe we did notice young starlings here in 1955, or perhaps 1954. I saw my first one in the Kelowna Park, in the spring of 1955...I have not found a nest... they are here summer and winter.... Out here in Rutland, 7 miles east, we had a few starlings the last year--mostly in the stock pastures in summer and about the yards last winter.... Actually I have never seen a starling about the orchard here, a mile above Rutland flats.

Starlings wintered in Kelowna all last winter (1955-56), feeding daily at trays on Morrison Ave., along with blackbirds, juncos, and woodpeckers, etc. I often saw the starlings there... there were altogether perhaps two dozen starlings there all winter. The Wormans (Mr. & Mrs. E. Worman) noticed starlings also at other places about town quite often. And I have done so myself...I have seen flocks of hundreds (in summer)."

(f) E. A. James-Veitch, Rutland. "The first starling that I saw here was a dead one; that was in the fall of 1954. People had reported them before that but I hadn't seen any. The first nests that I saw were behind my house in two tall cottonwood trees... that was in the first couple of weeks of May, 1954. I have seen many of them since. The last ones I saw (1956) seemed to be congregating in a marsh on an old dead tree last September." He found a nest in a shack at Rutland Sawmills on May 14, 1957.

(g) H. J. Baerg. "According to my records, in the spring of 1953 friends of ours living at Woodsdale about 16 miles south of us at the southern end of Woods Lake, near Winfield, described a new bird they had seen on their lawn. Their identification left no doubt in my mind but that it was a European starling. I was familiar with these birds from Kansas.... In 1955 there were at least three pairs nesting along Coldstream Creek across the road from where we lived and about half a mile east of Kalamalka. There were also at least three nesting pairs around the beach at the north end of Kalamalka."

(h) Rev. Austin Mackie, Vernon. "Round here they have nested for four or five years in house-roofs along the shore of Kalamalka Lake, also in a ranch-house near Okanagan Landing. They regularly inspect our bird-boxes in spring but seem to prefer buildings as nesting sites. A neighbour in whose roof two pairs built reported seeing a flock of at least 500 last fall (1956), and he identified them by their yellow bill."

(i) J. T. Fowle, Vernon. "I think it was in 1952 that I found my first starling nest here in the Okanagan, but I fancy they had been nesting in 1951. They are rapidly increasing here and many old woodpecker holes have been taken over by them. There were five nests in the cottonwoods at Kalamalka Lake this year (1956), two in cottonwoods about 1/2 mile east of the ranch.... Mr. J. A. Munro told me there were around 400 at Okanagan Landing.... I have seen starlings off and on since early spring to date. The last I saw four days ago (November 18, 1956) in Vernon (four birds on one of the packing-house roofs). I had a start of a roost in my Norway Spruce in the fall of 1955 (October). First ten birds showed up, next night about 15. I tried a 12 gauge on them and for two days they kept away, then about 45 arrived, just at dusk along with a flock of blackbirds and I had 40-50 birds for three or four nights. Then they suddenly stopped coming...."

(j) J. A. Munro, Okanagan Landing. August 28, 1956, flock of 350-400 possibly migrating. On September 5, 1956, a flock of 175-200 possibly migrating.

(k) J. Grant, Vernon. Of the nesting at the Country Club on Kalamalka Lake he says that he is sure that starlings were there from 1952-1955, but in 1956 there was no definite record of nesting, though he is pretty certain they did. M. T. Myres found them nesting there in May, 1957.

"The late Jim Wyhne of Grindrod told me that starlings were breeding in that vicinity in 1954.

I have no proof that they have successfully wintered in the Vernon district although we have scattered winter records.... Right now it appears that they prefer to migrate to the Coast for the winter and I doubt that we will ever have a very high winter population here.

I have seen no signs of winter roosts this fall (1956) and in fact have seen no starlings now for nearly a month." (written Dec. 4, 1956)

TABLE 2

OKANAGAN REGION RECORDS: 1952-54

1952			
April 3	Rutland	Five	J. Grant (in litt.)
April 6	Vernon-Okanagan Landing	A large number in the fields	W.B. Johnstone (in litt.)
April 10	Grand Forks	Nine	W.B. Johnstone (in litt.)
May 6	Vernon (Country Club)	One pair with nest of noisy young	J. Grant (in litt.)
Oct. 5	Swan Lake, Vernon	30-40	J. Grant (in litt.)
(1952)	Monte Creek	Four	P.W. Martin (in litt.)
1953			
April 7	Sullivan Valley, Kamloops	Male taken	P.W. Martin Collection
May 12	Vernon (Country Club)	One pair & nest of young in wall	J. Grant (in litt.)
May 15	"Grindrod"	Pair nesting	Munro (1953)
May 24	Okanagan Landing	Three	Munro (1953)
May 24	Grand Forks	Pair feeding young in hole in poplar	W.B. Johnstone (in litt.)
May 26	Okanagan Landing	One	Munro (1953)
June 17	Enderby	One egg collected	U.B.C. Collection
"summer"	West Summerland	First noted nesting	E.M. Tait (in litt.)
"fall"	Monte Creek	About 18 (late Sept.-early Oct.)	P.W. Martin (in litt.)
1954			
April 9	Vernon (Country Club)	One on range above club	J. Grant (in litt.)
May 6	Enderby	Clutch of 5 taken	U.B.C. Collection
May 7	Lavington	One pair with nest in wall of shack	J. Grant (in litt.)
"May"	Vernon (Country Club)	Two nests	J. Grant (in litt.)
May 13	Enderby	Adult female taken	U.B.C. Collection

TABLE 2 (cont'd)

1954			
May 26	Enderby	Adult female taken	U.B.C. Collection
"summer"	North Kamloops -Tranquille	Three or four	D. A. Arnott (in litt.)
"summer"	Grindrod	J. Wynne reported breeding	J. Grant (in litt.)
"fall"	Kamloops	Flocks of up to 30-40	P. W. Martin (in litt.)

Note: For Christmas Bird Censuses at Vernon (1951-57) see Table 6.

TABLE 3

J. GRANT'S RECORDS
1955 & 1956

1955.	May 20	Lavington	One looked in at a bedroom window.
	May 26	Vernon (Country Club)	Three pairs with nests (two in cottonwoods, one in hole in wall)
	October 22	Otter Lake, near Armstrong	More than 100 eating chokecherries
	October 31	Semlin Ranch near Cache Creek	One, perched on steer's back
	December 11	Okanagan Landing	Two, with robins
	December 26	Vernon	16 (Christmas Bird Census)
1956.	March 20	Vernon (Coldstream district)	One (first of the year)
	March 22	Vernon--Okanagan Landing	Numerous, in flocks and pairs, around flooded fields
	April 25	Lavington	One, carrying nesting material
	"June"	Vernon	Pair with a nest in a woodpecker hole in a birch tree. Corner of 32nd Ave. and Pleasant Valley Road

(cont'd)

TABLE 3 (Cont'd)

1956.	"June"	Coldstream	Pair with a nest in a woodpecker hole in a birch tree in the yard of E. Alderman. A pair of sparrow hawks occupied a hole close to the top of the same tree.
	June 15	Vernon Commonage	A nest with noisy young in a woodpecker hole in an aspen on the Commonage, 7 miles south of Vernon
	October 27	Otter Lake, near Armstrong	About 175

The only nest record for Oliver is one reported on a house in 1956 (W. Preston, pers. comm.). Apart from the nesting records at Enderby and Grindrod on the Shuswap River north of Vernon there has been one record of breeding at Chase, in 1956, according to J. T. Fowle (in litt., Nov. 22, 1956).

In the Kamloops area, P. W. Martin first observed starlings in 1952 and the fall of 1953 and 1954 (in litt., June 27, 1956) as illustrated in Table 2. He took an adult male on April 7, 1953 in the Sullivan valley NE of Kamloops (pers. comm.). Mr. W. Huxley of the Dominion Entomological Laboratory in Kamloops found a starling dead on the road near Tranquille in October, 1953 (in litt., March 18, 1957). In 1954 D. A. Arnott of the same laboratory noted a few starlings (three or four) along the Tranquille Road. On May 14, 1954 Dr. I. McT. Cowan took an adult female with an incubating patch, on the Lac du Bois range a few miles NW of Kamloops (U.B.C. Collection No. 4479). In the fall flocks of 30-40 were seen near Kamloops (Martin, in litt., June 27, 1956).

On June 6, 1955, Martin noted starlings at Monte Creek, Westwold, Vernon, and Westbank, on a trip down the Okanagan valley from Kamloops (in litt., June 18, 1956). In July, 1955, Arnott saw some 15-20 starlings in a flock of cowbirds near a stockyard at Halston, one mile north of North Kamloops (in litt., Dec. 11, 1956). W. Huxley is also reported to have seen small numbers of starlings in summertime about the barn and adjacent field at the Laboratory for two or three years before 1956. J. Grant saw a starling at Cache Creek on October 31, 1955 (Table 3),

and the same month Martin saw flocks of up to 200 at Cache Creek, as well as at Kamloops (in litt., June 18, 1956). In 1956 ten to twelve birds stayed around the Laboratory during the summer, and Martin (in litt., June 27, 1956) noted that starlings appeared to be slightly more abundant that year.

In 1955 the fall flocks in the vicinity of Kamloops had increased to hundreds of individuals, and a regular daily movement had begun east and west in the valley of the South Thompson. By the fall of 1956 Martin knew that the roost was in the vicinity of the Indian Residential School on the north bank of the S. Thompson River at Kamloops. In 1957 about 200 starlings "started to use a small swamp on the Vickers property about 3 1/2 miles E of Kamloops." This swamp is composed almost completely of Typha sp. with some Scirpus. The cover is very dense in the autumn.

> "It would appear that the use by starlings was initiated by the use by redwing and yellow-headed blackbirds, as all these birds flighted into the roost simultaneously. The roosting was confined to the dense growth of bulrushes.... They continued to roost in the Indian School site in company with blackbirds." (in litt., Nov. 18, 1957)

Martin's description of the flights in August and September, 1955 (in litt., June 18 & 27, 1956) is also worth quoting in its entirety:

> "...a regular flight occurred each day in the evening in the Thompson valley east of Kamloops. This daily movement of birds appears to be a movement from roosts to feed grounds in the morning and back to roost in the evening again. The starlings move in company with Brewer's blackbirds and redwings.... At least 500 birds passed over my house each evening for at least the first three weeks of September.... I have seen the eastward movement in the morning just at sun up, and the westward movement to the roost occurs for about a month every evening at sundown. They fly over the house at about 45 yards' height.... The last large flocks were observed in late October."

In the fall of 1957 about 600-800 starlings were flighting over Martin's house at the peak period in September. Flighting and

roosting ceased about the middle of October. Their departure appears to have been earlier than in earlier years despite the mild weather. Writing on November 26, 1957, Martin states that he had not seen a flock for about two weeks.

Martin summarizes the status of the starling in the Kamloops district (in litt., June 18 & 27, 1956) as follows: "Starlings are relatively abundant now throughout the Interior grassland and farming areas. They wintered (only 6 or so birds) at Salmon Arm last winter.... There are noticeably more starling this spring throughout the whole of the Interior." On June 11, 1956 he observed an adult starling feeding a young bird in his garden at Kamloops. In 1957 the starlings returned with the robins and bluebirds during the last week of February (W. Huxley in litt.) and on March 18, 1957, Huxley was able to write that "there are a fair number back now...I saw a pair today. The male was singing." On May 19, 1957, Pat Martin and M. T. Myres found a starling's nest with 6 eggs (incubating) on the Rose Hill Range near Knutsford.

In the vast range grassland areas which lie between Princeton and Kamloops there exists a big area of suitable starling breeding habitat, especially on the Guichon and Douglas Lake spreads. Unfortunately we do not at present have any breeding records from this area which centres on Nicola Lake. The only record from this region is one made on August 15, 1956, by M. T. Myres who saw four starlings among a transient flock of about 500 redwinged and Brewer's blackbirds on the outskirts of Merritt that day.

In conclusion it can be said that the evidence available goes to show that in the Okanagan valley, the Kamloops area, and probably in the Nicola country, as well as the eastern South Thompson valley and Shuswap River valley, the starling has achieved the status of a common breeding species in open country (with cottonwoods, aspens, or other suitable nesting sites) and around human habitations (but perhaps not in the fruit orchards of the Okanagan valley) in the short period of four years (1952-1956).

It is also evident that while the great majority of the birds now migrate to the coast for the winter, there are two other patterns of behaviour which have developed:

(1) In the early years, 1947-1952, small groups of starlings from farther east wandered randomly through the interior of the

province, instead of repairing to the mild coastal belt, which, of course, they had not before experienced, and

(2) since 1955 an attempt on the part of some flocks, aided by the increase in population size, to establish a pattern of fall roosts and roost-feeding ground flight lines (P. W. Martin at Kamloops, and J. T. Fowle at Vernon). These flocks of birds by establishing a routine, and by nature of their gregariousness, seem to have stayed on quite far into the winter--even into November, after the first snowfall, before migrating to the coast. Judging from the evolution of starling behaviour in other areas, as the boundary of its expansion spreads farther and farther west from a given breeding area, over-wintering by as many as 5% of the population (Alberta) or more (Manitoba) may be expected to develop in the southern interior of British Columbia in the very near future.

(5) The Cariboo and Chilcotin Districts

Munro (1945) makes no mention of starlings in the Cariboo Parklands. Nor does he refer to them in his Supplement (1955b) to the main paper on that region. But, as has been recounted earlier, the first record of breeding of the European starling in British Columbia occurred at Onward Ranch near 150-Mile, Cariboo Highway in 1948, about 120 miles NW of Kamloops.

Jobin collected specimens on April 30, 1948 and on November 26, 1948 (Racey, 1950; Jobin, 1952), and according to Racey (1950) he saw four starlings at Alkali Lake on November 20, 1949. Another specimen was taken by Jobin (adult male) at Alkali Lake on November 3, 1950, but this is not now in his collection (pers. comm.) because it was made up into a study skin for Williams Lake High School.

There is no proof that breeding occurred in the Cariboo or Chilcotin during 1949 or 1950, but in 1951 Jobin found a pair of starlings nesting near the Williams Lake stockyards, and took a specimen there, as already discussed, on April 6, 1951 (not on April 26, as stated in Jobin, 1952). This was the third nesting record for British Columbia (the second having been at Brisco). A week after this record, on April 15, 1951, Mr. L. A. Malfet took a male and a female starling at Williams Lake.

In 1951 Jobin acquired four more study skins during the fall:

(a) No. 1308, an adult male taken at Williams Lake on Sept. 6.

(b) An adult male taken at 149-Mile, Cariboo Highway, also on September 6. This specimen is also no longer in the Jobin Collection, and was instead made into a study skin for Williams Lake High School (pers. comm.)

(c) No. 1311, an adult male taken by Mr. Jack Wynstra at Horsefly on October 21.

(d) No. 1313, also taken on October 21, and sent to Jobin by W.A.B. Paul (pers. comm.). This bird originated near Kleena Kleene (Jobin, 1952; Paul, 1958), in the western portion of the Chilcotin District.

It is really of no slight interest that the majority of the early published and unpublished records of starlings in the central Cariboo District are in the form of study skins. We owe Mr. Jobin a debt of gratitude for this tangible evidence of the early colonization of British Columbia by the starling.

On June 23, 1952, Jobin took a juvenile male (still being fed by its parents) near the Williams Lake stockyards, a repetition of the breeding of the year before (No. 1381 Jobin Collection) and on September 10, 1953 a juvenile male, partly in adult plumage, was taken near these same stockyards (No. 1659). Mr. L. A. Malfet took a female at Lac la Hache on October 11, 1953. In May, 1954 (May 14?), Dr. I. McT. Cowan saw starlings at 105-Mile and 150-Mile, Cariboo Highway.

In the summers of 1955-1957 M. T. Myres was able to study the abundance of starling nests at Westwick Lake, 10 miles south of Williams Lake, on the road to Alkali Lake. (See Fig. 6.) There had been a number of previous records of starlings near Alkali Lake (by Jobin), and on May 3, 1955, P. W. Martin recorded a pair of starlings in Empire Valley (China Creek or Coster Creek) just below Gang Ranch, on the west bank of the Fraser River. On May 5, 1955, I first saw starlings at Westwick Lake: three feeding and prospecting holes in aspen trees. Two were seen at the same spot the next day and on May 7, two were seen a couple of miles to the north at "Fear's Lake." On May 8 a pair was seen at a hole at my campsite, but it was not until May 30 that I realized that there were two nests in flicker holes in tall, almost dead aspens, close to my tent. Young could be heard calling in both. On June 1, I found it possible (with the help of Mrs. Nancy McAllister) to band one of these broods. It was one of these five nestlings which was found the following February in Vancouver. (See Fig. 9.)

In 1955, although I was walking the ranges at Westwick almost daily, I found no other nests (other than the two in the campsite). I did, on one occasion, observe a bird emerge from another tree half a mile away up Sorensen Lake, and I suspected that there had been a nest there. This tree fell down during the summer.

In 1956 the same two nests were occupied in the campsite. I was walking the ranges far less often in 1956 than I had the year before. Nevertheless I found five more starling nests, all in sites that I had been past the year before. In 1957 I visited Westwick Lake only during two weekends. I was unable to ascertain whether the two original campsite nests had been occupied certainly, but there were three other occupied sites in the trees closeby. Four other nests were found in new sites, and it was very definitely my impression that the number of breeding pairs was considerably greater in 1957 than it had been in 1956 or 1955. Probably 1956 had been a successful reproductive season. Parties of young birds were often seen on the ranges in June and July 1956 (e.g., a party of at least 15 which were flying about noisily and conspicuously at Boitano Lake on July 4, 1956). The increase in the number of nests found at Westwick Lake is illustrated in the following tabulation:

Observations of M. T. Myres

	1955	1956	1957
Nests found	2 (?3)	7	10 (? 12)
Birds banded	5/y.	19/y.	4/ad. + 1/y.

I was careful to note the occupancy of a large number of hole-sites while I was working at Westwick Lake. Those which were ever occupied by starlings are listed in Table 4. Of the three nests occupied in the campsite in 1957 for the first time, one had been occupied by tree swallows, one by a pair of flickers, and one by mountain bluebirds, in 1956. The flicker-nest had been made in 1956 and in 1957 these birds (the male was the same individual as had been present in 1956 & 1955) had excavated a new hole. At a tree along Westwick Lake a pair of flickers had exchanged sites with a pair of starlings. A hole at Boitano Lake, and another on Westwick Lake (occupied in 1956) were not occupied in 1957, but on the ranges near "Goldeneye" Lake one (? two) nest(s)

Fig. 5.
View towards Onward Ranch, 150-Mile, B. C., where the first nest of the starling was found in 1948. Note the semi-open country side with small, exposed stands of Populus.

Fig. 6.
Author's campsite at Westwick Lake, B. C., in 1955. Within a few yards of the tents there were, by 1957, no less than 5 nesting sites which had been used by starlings. Nest No. 1 (Fig. 9) is just to the left of the picture.

Fig. 7.
Grass ranges of the kind found in the Nicola country and Chilcotin. The view shown is that up the valley of Alkali Creek.

Fig. 8.
Sorensen Lake, B. C. In 1957 there were two nests in the trees on the right, and one in the trees in the gulley on the left of the picture. At the present time light planes are but rare visitants on the ground at this haven of peace!

(Photos by M. T. Myres)

NESTS OF THE STARLING FOUND IN BRITISH COLUMBIA

Fig. 9.
This is the nest in which a banded nestling which travelled to Vancouver, B. C., was raised. It is in the 1955 Westwick Lake campsite.

Fig. 10.
Occupied by a flicker in 1955, a tree swallow in 1956, and a starling in 1957. Also in the Westwick Lake campsite.

Fig. 11.
Occupied by a bluebird in 1956 and a starling in 1957. Tree is in the Westwick Lake campsite.

(Photos by M. T. Myres.)

TABLE 4

STARLING NESTS AT WESTWICK LAKE, B. C. (AND VICINITY)

	1955	1956	1957
In Campsite:			
(1) Aspen (Fig. 9)	Starling	Starling	? Starling
(2) Aspen	Starling	Starling	? Starling
(3) Aspen stump (Fig. 10)	Flicker	Tree swallow	Starling
(4) Aspen stump	---	Flicker	Starling, then tree swallow
(5) Aspen (Fig. 11)	---	Mountain bluebird	Starling
Westwick Lake:			
(6) Aspen } same tree	Flicker	Starling	Flicker
(7) Aspen } same tree	---	Flicker	Starling
(8) Aspen	---	Starling	nil
Sorenson Lake:			
(9) Aspen	Flicker	---	Starling
(10) Aspen	---	Starling	Starling
(11) Aspen	---	---	Starling
"Goldeneye Lake":			
(12) Aspen	---	Flicker	Starling
(13) Aspen	---	? Flicker	Starling
(14) Aspen	---	Starling	Starling
Boitano Lake:			
(15) Aspen stump	---	Starling	Tree swallow

(Arrows indicate supposed movements of given pairs of birds.)

occupied by flickers in 1956 had been appropriated by starlings. These observations indicate the problems involved, so far as native species are concerned, following the incursion of the starling into the parklands.

North of Williams Lake there are very few records of starlings until one reaches the "Lakes District" (discussed in the next section). In the fall of 1954 Martin Malfet saw some starlings at Quesnel, but did not collect any. On June 22, 1954, three starlings were seen by J. Grant (in litt., Dec. 4, 1956) at Webster's ranch in the Narcosli Creek district SW of Quesnel. On the same day a pair was seen at a flicker hole nine miles SW of Quesnel. On September 22, 1955, the same observer (in litt., October 26, 1956) saw 20 starlings in a flock of blackbirds at Buck Ridge, on the west bank of the Fraser near Alexandria, not far from the earlier records. The only other record from the Quesnel area is one made by John Hayward and P. Symons (pers. comm.) on June 16, 1957, about 3 miles from Quesnel towards Dragon Lake in an agricultural area. Three or four birds were seen and one of them was flying in and out of a hole in an aspen.

From east of the Cariboo Highway records of starlings are scant. The area concerned is a broad belt of country which extends as far as the North Thompson valley. In its eastern portions it is mountainous and in Wells Gray Park and the Cariboo Mountains altitudes go over 8000 feet, and the terrain is heavily forested with western red cedar (Thuja plicata) and hemlock (Tsuga heterophylla), which are characteristic of the Columbia valley rain forest. Nearer the Cariboo Highway, from 70-Mile to Quesnel Lake, there are areas of open meadows and grasslands, but they are nowhere extensive.

The first record from this belt of country is the specimen taken at Horsefly on October 21, 1951 (already mentioned). P. W. Martin (in litt., June 18, 1956) has seen starlings at Watch Lake Lodge (nesting behaviour about a hole in an aspen, May 17-18, 1955), and at Green Lake ("some," May 6, 1956), NE of 70-Mile. Dr. D. M. Whitelaw, who spends part of each summer in the Bridge Lake area, has not seen starlings there although he has been on the look out for them (in litt., June 16, 1956). The area, he says, is fairly thickly wooded, and areas of open meadow (which are probably necessary for foraging) are small and patchy. H. B. Hammer found starlings nesting at Canim Lake during June, 1957 (in litt., Nov. 15, 1957). Mrs. Hettie Miller at Murtle Lake in Wells Gray Park, where there is thick hemlock-

cedar-fir-spruce forest at 3500 feet, has not seen starlings yet (in litt., June 1, 1956). However, she mentions that there are some open meadows around the lakeshores. Fay H. Hartman (pers. comm.) tells me that he flushed a starling from a hole on the west side of Clearwater Lake, at a slightly lower altitude on June 14, 1955. The hole was in a burnt conifer snag at a height of 40 feet from the ground.

Records from the Chilcotin District are also scanty. Mention has already been made of the pair seen in Empire Valley on May 3, 1955 and of the birds seen west of the Fraser River between Castle Rock and Baker Creek (Quesnel) in 1954 and 1955. The first record for Lillooet was not made until 1957, when birds were twice seen in October. Three were seen on October 8 and seven on October 27, 1957 (per W. M. Hughes, in litt., Nov. 19, 1957). All three localities are close to the west bank of the Fraser River.

At Kleena Kleene in the western part of the Chilcotin, 135 miles directly west from Williams Lake, starlings were not seen until 1951. In the spring of that year two were seen in a field in company with two Brewer's blackbirds, by W.A.B. Paul. On October 21, 1951, as already mentioned, one was brought alive to Mr. Paul. This bird is now No. 1313 in the Jobin Collection. In the same year Andy Christensen of Anahim Lake ranch identified a starling from bird books (Paul, 1958).

Paul did not hear of any more starlings until 1955. In that year breeding was established at a number of points along the Bella Coola road (Paul, op. cit.). A nest was found near Tatla Lake, and another near Hanceville. Mr. Tom Chignell also "knew of two or three other nest locations." In 1956 six starlings appeared at Mr. Chignell's farm, five miles west of Tatla Lake, and two nests were found there. Another nest was found at Fred Brink's farm, one mile west of One Eye Lake, and three starlings were later banded there (Paul, op. cit.). M. T. Myres observed four starlings near Chilanko Forks on May 26, 1956. In 1957 the number of pairs successfully nesting at Tom Chignell's farm was again two (three pairs being present) and a pair raised young at Stan Dowling's ranch (Paul, op. cit.).

F. M. Shillaker of Chezacut (Chilcotin Lake), 50 miles NE of Kleena Kleene, tells me (in litt., Nov. 15, 1957) that although he has been watching blackbird flocks closely, he has not seen a starling at Chezacut to date.

It is evident, I think, from this account that there has been a breeding population of starlings in the Cariboo Parklands for nearly ten years, but that the initial increase of population was slow or intermittent, and that the bird did not become conspicuous until 1952 or 1954 while in the Okanagan valley the breeding population has built up very rapidly since the first nest was found in 1952.

At the present time there are sizeable breeding populations in both Cariboo and Okanagan, but for equal areas the bird will undoubtedly be more common in the Okanagan, and the adjacent grass ranges in the Nicola country to the west, between Princeton and Kamloops, than in the Cariboo Parklands. Surprisingly we have as yet no breeding records from the Nicola country, but there can be little doubt that the starling is breeding over a wide area there now in aspen groves in the grasslands. In the Cariboo and Chilcotin open grasslands are much less expansive and indeed there are few places where one can find grasslands extending almost as far as the eye can see, as one can in the Nicola country. The San José valley, along which the Cariboo road was cut from near 100-Mile to Williams Lake, gives the traveller an entirely false idea of that country, for although the ranges here are extensive, they are arranged lineally along a NW-SE bearing, and as soon as one takes a road off the highway to east or west he finds himself in Douglas fir-lodgepole pine (Pseudotsuga menziesii and Pinus contorta) seral forests through which small open meadows bordered by aspen are thinly sprinkled. The main areas of open range, comparable to those near Douglas Lake Ranch or Stump Lake in the Nicola country, are to be found at Alkali Lake and the areas to the northwest in the Chilcotin (Riske Creek, etc.).

As one follows the line of the Fraser River northward on the map he observes that already at Quesnel it is close along the western slopes of the Cariboo-Monashee Mountain systems which extend from Prince George through Wells Gray Park to Salmon Arm and the Arrow Lakes. The centre of the great interior plateaus lies well to the west of the Fraser River, roughly along a line from 70-Mile through Riske Creek to Burns Lake. It is hardly surprising therefore that patches of range should still be found in the "Lakes District" in the vicinity of Vanderhoof, to be discussed in the next section. Although starlings are as yet scant as far west as Kleena Kleene they are evidently present in the Chilcotin valley in the summer time and we may expect them to become fairly abundant in the grasslands of the northern Chilcotin.

(6) Central British Columbia

Munro (1947a) defined an area extending from the latitude of Gang Ranch to the north of Finlay Forks, and from about 121.00 W to 128.00 W as "central" British Columbia. I shall use a more restricted definition, namely an area bounded by a line which reaches to Quesnel, Prince George, and Fort McLeod, Hazelton and down the east slope of the Coast Range to just north of Anahim Lake, as indicated in Fig. 1. I have already discussed the records of starlings from the southern Chilcotin, and the areas south of Quesnel.

In his survey of the "central" region in 1944, Munro (1947a) did not record any starlings. Nor did he observe any during his work in the "Lakes District," 10 miles south of Vanderhoof in 1945 and 1946 (Munro, 1949), when he had a base camp at Nulki Lake, nor does he mention them in a later paper on the same region (Munro, 1955a). However, in 1953, he did in fact take a number of specimens at Nulki Lake (see Appendix, and Munro, 1956).

The first definite records of starlings in this region were published by Racey (1950) who reports that J. C. Shelford, then of Burns Lake, saw many starlings between October and December, 1949, in that part of the country, and that he also saw a flock of over 30 at Wistaria on Ootsa Lake. Racey (op. cit.) also states that Shelford "had also heard from many persons living in the lakes district stating that they had seen starlings." Shelford certainly took a specimen at Ootsa Lake in November, 1949, and sent it to the Department of Zoology, at the University of British Columbia (U.B.C. Collection No. 2227).

On the other hand J. C. Shelford himself has informed me (in litt., Dec. 15, 1956) that he saw his first starling in 1947 when several broods turned up in the fall and stayed for about three months before disappearing when snow became deep. He states that they reappeared in the spring of 1948 and again in the fall, but did not stay that winter. In 1949 they once "again reappeared in the fall but didn't winter in the district." Perhaps it is this that Racey (1950) published, and Shelford forgot to mention the earlier records. When questioned further about these early records Shelford tells me (in litt., Nov. 13, 1957) that "I have no written records," but that Racey's records appear inaccurate because from June, 1949, to September, 1949, he (Shelford) was ill and in October, 1949, left Ootsa Lake and moved to Burns Lake:

"I was in such poor condition from June, 1949, to January, 1950" that "I was in no condition to shoot starlings." However, a specimen was quite certainly obtained in November, 1949, at Ootsa Lake. Shelford wrote, however, that "I am also sure that they had turned up in the spring and fall of the previous year before a specimen was taken," and it seems to me that whether he saw starlings first in 1947, 1948, or 1949 is, in the eventuality, immaterial since the indications are that starlings were appearing even in these more northern regions of the province at an early date (Fig. 2), and certainly as early (or as late) as 1949. They did so, not only in two consecutive autumns but also during the intervening spring. We can only speculate that they originated in the Peace River country, and that ones seen at Ootsa and Francois Lakes, and at Bella Coola, most probably came from much the same points of origin. Starlings were seen at Bella Coola both in the winters of 1946-47 and 1948-49. They had, furthermore, bred near Williams Lake in 1948.

From about 1950 until December, 1956, Mr. Shelford did not hear of any more starlings being seen in his region (in litt., Dec. 15, 1956), but at Fraser Lake Mrs. W. C. Morley saw starlings in 1953 and 1954. On May 6, 1953, four starlings were seen (Prov. Mus. records, and in litt., March 10, 1956), and her son Fay H. Hartman shot one, which is in his collection (see Appendix). According to the journals of Dr. I. McT. Cowan, Fay Hartman had reported that two of the birds seen in May, 1953 were going in and out of a woodpecker's nest cavity. Mrs. Morley writes of the original observation:

> "The three remaining were seen all summer and into the winter which was mild until January 14, 1954, when the temperature was 6 degrees below zero. There was a terrible east wind and that day we saw two starlings. On January 17, 1954, the temperature was 36 below zero and two starlings were found dead about the farm."

One of these ("found frozen at Fraser Lake" on January 16, 1954) is in the U.B.C. Collection (No. 3125).

Munro (1956) stayed in the "Lakes District" from September 17 to 30, 1953. Approximately 250 starlings were present, and the largest flock seen was 120 at the Dickson farm on September 17. Starlings were also seen in November, 1953, and January and March, 1954 (Munro, 1956) at the same time, it will

be noted, as they were present at Fraser Lake about 30 miles to the west. In the J. A. Munro Collection there are six specimens (four of which are immature) taken at Nulki Lake between September 18 and September 26, 1953. They had been feeding on chokecherry (Prunus sp.) exclusively. No starlings were observed in the same area between May 20 and June 6, 1954. Mrs. Morley makes no mention of starlings being seen during the summer of 1954.

Mrs. Morley (in litt.) states there has been no further attempt to breed at Fraser Lake although in 1955 "there were more here" and Gerald Hartman saw some at Fort St. James. This record, along with one observation by W. D. McLaren on May 7, 1957, of a single bird near the turn-off to Pinchi Lake, about 12 miles north of Fort St. James constitutes the most northerly record so far of starlings on the cordilleran plateau, but this location is still well south of the latitude of the Peace Country to the east and Juneau to the west.

In 1956, several starlings were observed at Newlands, and Aleza Lake, 25-35 miles NE of Prince George on June 9, and scattered birds were seen in the Salmon River valley north of Prince George, also in June (J. Grant, in litt., October 26, 1956). It is of interest that J. Grant wrote to me that "from 1950 to 1955 inclusive I spent the summers from late May to mid-September in the Prince George Forest District which extends from about Quesnel north to the Yukon. My opportunities for observing starlings during the summer were therefore restricted to that area, which was apparently not invaded until quite recently, except for the Peace River district." It is significant that his only records from the Quesnel vicinity came in 1954 and 1955, and that his observations of starlings elsewhere in Central British Columbia (as here defined) did not begin until 1956. J. C. Shelford reports (in litt., January 4, 1957) that "I have had reported to me that two starlings are wintering at Bill Richmond's at Burns Lake; he is our game warden and says they are feeding out of the dog dish."

The conclusion which I think may be drawn from the pattern of these records is that each fall, as early as 1947 or 1946, starlings migrated into this region from the Peace River country. Fort St. James is 150 miles almost directly SW of East Pine, which is at the confluence of the Pine and Murray Rivers west of Dawson Creek. The Shelford, Morley, and Munro records of starlings are all strongly concentrated into the fall period when one would expect starlings to be travelling on a SW bearing. The

implication seems very strong (since, apart from the May, 1953 record at Fraser Lake, there is no evidence of breeding before 1955 or 1956 in the area), that the starlings seen before about 1955 were all fall migrants from the Peace River district. The summer records in 1956 and 1957 seem indicative, by contrast, of the beginning of nesting in the regions north of Quesnel, although much of this appears to be marginal breeding habitat, since there is little open grassland present to provide feeding ground. At the present time suitable areas of not too dense forest from the vicinity of Prince George to Fort St. James and Burns Lake may be a nesting area. But we do not know just how far the species has penetrated northwards in the intermontane areas.

(7) Northern British Columbia and Yukon

I have received no reports, and there are none published, of starlings north of a line from Fort McLeod to Hazelton, west of the Rocky Mountains, and east of the Coast Range. However, starlings are in the Peace River country, and we may expect them to breed in the Pine River valley (though I have no reports of this). There are as yet no records either from Yukon. But since starlings have penetrated as far north as Mile 71, Mackenzie Highway, Keg River, Wood Buffalo National Park, Yellowknife, and even Fort Wrigley (Myres, 1958), often into extensive muskeg country, there seems no inherent reason why they should not penetrate beyond the Peace River farming country to Fort Nelson, Watson Lake, and Whitehorse. It must surely be a matter of time only before these places become occupied, just as Churchill has been occupied in northern Manitoba. In such places, however, there is a tendency for human habitation to be an essential requirement for the starling, since aspen is scarcer, or less abundant in these climates. We do not know the extent to which nesting may occur in holes in spruce trees.

(8) Southern British Columbia Coast and Vancouver Island

The first starlings seem to have appeared in the Lower Fraser valley in the winter of 1948 or 1949. Miss E. K. Lemon tells me (in litt., Dec. 4, 1956): "I saw the starling for the first time at Cloverdale in 1948," while Racey (1950) reports the following observations:

(a) Mid-December, 1949. Mr. Harling of Hall's Prairie, Surrey, saw four.

(b) January 11, 1950. Dr. I. McT. Cowan saw five at the foot of Blundell Road, Lulu Island, while a few days later P. W. Martin and Charles Guiguet saw more at the same place.

(c) January 20, 1950. P. W. Martin saw two starlings in a yard in 4600 block West 8th Avenue close to the University Endowment Lands in Vancouver. It seems, therefore, that the first wintering of starlings in any numbers in the Lower Fraser valley was in the winter of 1949-50.

Subsequent reports of starlings from the southern coast are in fact rather few, though there can be no doubt that the winter population has been steadily increasing. The first records from Vancouver Island were not made until the fall of 1951 and winter of 1951-52.

On September 6, 1951, C. J. Guiguet of the Provincial Museum observed two starlings in Victoria (Guiguet, 1952a) "following a report by Fenwick Lansdowne of that city." On December 21, 1951, Pearse (1953) observed an "adult and bird of the year" feeding on his lawn at Comox, and he states that "so far as I know this is the first record for Vancouver Island north of Victoria." Mr. Hamilton Laing, of Comox, tells me (in litt., Jan. 21, 1957) that the first starling record he has is of three birds on January 16, 1952. Mrs. J. Stubbs reported to him that she had seen one on the same day. This record is only a month later than that reported by Theed Pearse. Guiguet (1952b) reports starlings as having been seen in the spring of 1952 at Telegraph Bay, Ten Mile (Cadboro) Point, and Glen Lake, all near Victoria. On April 9, 1952, a pair was seen by a Provincial Museum party at Goldstream. Guiguet (1952a) noted that "from the number of reports received at the Museum during the past year it seems likely that the species is now established on Vancouver Island." However, the area actually covered by these records is strictly limited, and is nothing more than a coastal fringe. The claim would in any case apply only to winter status at that time.

It is possibly significant that the first records for the Queen Charlotte Islands also occurred in the winter of 1951-52. Other records of starlings from Vancouver Island are listed in Table 5. The first record from the west coast of the Island was not made until November 11, 1957, when C. J. Guiguet (in litt., Nov. 27, 1957) saw 8-10 starlings at Tofino. Tofino is 50 miles west of Port Alberni, and directly across the Island from Comox. It will be noted that the only summer records are two nests in

1952 and 1953 (to be discussed below), and sight records in 1955 (one record of 3 birds) and 1956 (three sight records in June or July with larger flocks arriving in August). Apart from these, all records are from the winter season.

The only nesting record for the south coast region of British Columbia occurred in 1952 and 1953 on a house in Victoria. It is quite possible that other records have been overlooked, but there have been no further reports of breeding up to the end of 1957. Therefore breeding cannot have been common and on the coast the status of the starling at present is that of a winter visitor. This is the situation also in California, and in both places the migratory habit of the bird takes it out of the area in the spring. Since none arrive from farther southwest over the Ocean in spring only the development of a non-migratory habit in certain individuals can alter the present situation. Probably during the next ten years this will happen.

The existing observation is unpublished and was reported to me by Mr. Mervyn Ball of Telegraph Bay Road, Victoria, as follows (in litt., April 25, 1956): He moved into a house there on May 1, 1952, and:

> "shortly after our arrival--most likely May 5-10, I picked up a nestling from the SW nest, that is almost directly underneath it. It was dead, of course, and I judged the age to be about 25 days.... I can confirm that there were two nesting pairs on this house in 1952."

The nests were under the eaves 27-30 feet from the ground. In 1953 the same two nesting sites were again used: Nest No. 1 had young in it by April 26 and they flew on May 22. Nest No. 2 was already occupied by late April and on May 19 Mr. Ball picked up a dead nestling on the ground under the nest which he judged to be 13-16 days old:

> "On June 5, 1953, I suggested to Mr. Charles Guiguet, that he...collect a specimen.... He came that day and shot one of the adult birds.... Apart from seeing one adult bird in the late evening of June 5, and another possibly the same bird on the morning of June 6, not a single starling has been seen by me or my family since then, in or about the garden area. No starlings have nested on the house since 1953."

TABLE 5. RECORDS FROM VANCOUVER ISLAND: 1953-1957

1953			
January	nr. Patricia Bay airport	ca. 20	Mrs. W. L. Taylor (in litt.)
May-June	Cadboro Bay, Victoria	2 nests	M. Ball (Prov. Mus. records and in litt.)
Sept. 27	Cadboro Bay, Victoria	40	William Cam (Prov. Mus. records)
October	Sidney	a small flock	Mrs. W. L. Taylor (in litt.)
1954			
Jan. 25	Patricia Bay Highway, opp. Beaver Lake Park	pair at feeding station	W.H.H. Preece (Prov. Mus. records)
Feb. 18	Victoria (Browning St.)	20-25	R. Marshall (Prov. Mus. records)
Feb. 23	Victoria	"seen quite frequently this month"	E.F.G. White (in litt.)
Dec. 18	Cadboro Point, Victoria	some	A. R. Davidson (Prov. Mus. records)
Dec. 18	Cadboro Bay, Victoria	20+	H. Self (Prov. Mus. records)
Dec. 19	Sidney	a small flock	Mrs. W. L. Taylor (Prov. Mus. records and in litt.)
Dec. 24	Cadboro Bay, Victoria	50-60	A. R. Davidson, and Audubon Field Notes 9(3).
Dec. 27	Victoria (Blenkinsop Rd.)	10	A. R. Davidson (per Mrs. G. M. Bell)
Dec. 29	Victoria (Finnerty Road)	40	A. R. Davidson (per Mrs. G. M. Bell)
1955			
Jan. 5	Victoria (Bowker Ave.)	50	C. J. Guiguet (Prov. Mus. records)
Feb. 16	Cordova Bay, Victoria	50	A. R. Davidson (per Mrs. G. M. Bell)
Feb. 28	Comox	20	Audubon Field Notes 9(3)
March	Saanich Peninsula	small flocks	A. R. Davidson (per Mrs. G. M. Bell)
May	Westholme Flats, Duncan	3+	J. Oyen (in litt.)
Oct. 15	Sidney	small flock	A. R. Davidson, and Audubon Field Notes 10(1)

1955 (cont'd)			
Nov. 6	Cadboro Bay, Victoria	25-30	Mrs. M. Ball (in litt.)
Nov. 13-16	Sidney (Towner Bay)	eating arbutus berries	Mrs. W. L. Taylor (in litt.)
December?	Comox	500 (estimated)	Audubon Field Notes 10(1)
1956			
Jan. 8	Brentwood Cross Rd.	12	A. R. Davidson (per Mrs. G. M. Bell)
Jan. 12	Victoria	8	A. R. Davidson & Aud. F. Notes 10(3)
Jan. 14	Corner Keating Cross Rd. & Old West Rd. (13 miles NW of Victoria)	30	C. J. Guiguet (Prov. Mus. records)
Feb. 11	Island View Beach, Saanich Pen.	4	A. R. Davidson & Aud. F. Notes 10(3)
Feb. 13	Oak Bay, Victoria	2	Mrs. G. M. Bell & Aud. F. Notes 10(3)
"spring"	Comox	2 flocks of 40-50	T. Pearse in Aud. F. Notes 10(3)
June 1	Oak Bay, Victoria	1	Mrs. G. M. Bell & Aud. F. Notes 10(4)
ca. June 18	Cadboro Bay, Victoria	10-12	M. Ball (in litt.)
July 10	Cadboro Bay, Victoria	7	A. R. Davidson in Aud. F. Notes 10(5)
August (first week)	Oak Bay, Victoria	ca. 25	C. J. Guiguet (in litt.)
August (last week)	Saanich Pen. (Slugget's Farm)	ca. 40	C. J. Guiguet (in litt.)
Dec. 21	Comox	25	H. M. Laing (in litt.)
1957			
Jan. 21	Comox	40-50 daily	H. M. Laing (in litt.)
Jan. 22	Sooke	40	D. J. DeRochie (Prov. Mus. records)
Jan. 22	Gorge area and Oak Bay H.S.	seen	Prov. Museum records
ca. Feb. 4	Alert Bay	ca. 16	W. W. Kennedy (in litt.)
Nov. 7	Finlayson Arm	6	C. J. Guiguet (in litt.)
Nov. 11	Tofino	8-10	C. J. Guiguet (in litt.)
Dec. 1	Vesuvius Bay, Salt Spring Island	ca. 10 with blackbirds	R. B. Weeden (pers. comm.)

The specimen referred to is in the Provincial Museum (No. 10073) at the present time (G. C. Carl, Director, in litt., June 27, 1956). It is of considerable interest that two pairs were breeding and that they did so two years in succession. It suggests the possibility that they were there in 1951 before Mr. Ball moved into the house and may have contributed to the winter population. There have not, however, been any other nesting records on the coast of British Columbia since. A pair, however, nested in 1957 at Blaine, Wash., on the coast of the mainland on the International Boundary. Mrs. C. R. Kline of Blaine (in litt., Nov. 3, 1957) tells me that she had put up a bird box in her garden in the spring and that she banded five young starlings from it on May 16, and a second brood on July 7.

The most remarkable feature of the starling's advent to the south coast is the large roost which has developed in Vancouver (Table 6; Figs. 12-16). This roost was first discovered on Nov. 20, 1954 by W. M. Hughes in the 1900 block West 14th Avenue. The birds were confined to this block and the trees being used were coniferous, including Lawson's cypress (Chamaecyparis Lawsoniana). According to people living in the area starlings had roosted there the winter before (1953-54), some 500 birds being present then (W. M. Hughes, in litt., Nov. 19, 1957).

On the Christmas Census of December 26, 1954, 2741 birds were seen at the roost; according to Mr. Hughes the maximum number was about 3000 birds. But Dr. I. McT. Cowan recorded on January 30, 1955 that there were 8000-10,000. Probably this figure was too high as on February 22, 1955, when an attempt was made to band some of the birds it was estimated that there were 2000 birds, though it was also noticed that there had been a reduction in the numbers present. The roost broke up that spring on April 4-5, 1955. On April 3 the numbers were usual, but on April 4 they were greatly reduced and on April 5 no starlings came into the roost (W. M. Hughes, in litt., Nov. 19, 1957).

Mr. Hughes has been keeping track of the subsequent spread of the roost into neighbouring areas. In the winter of 1955-56 the number had increased to about 8000 birds and on the Christmas Census of December 27, 1955 no less than 7631 starlings were counted coming into this roost (Victoria Naturalist 12. No. 8). Mr. Hughes writes (in litt., April 20, 1956) that he and J. G. Sarles were "working together as they came in to roost....I am sure we did not get them all, but did get 7000." In the same letter he tells me that the roosting area had expanded to include the

1900 blocks West 15th, 16th, 17th, and 18th Avenues, and also the 1900 block Cedar Crescent, as well as properties at 1598 Marpole Street and in The Crescent, Shaughnessy Park (this is east of Granville Street).

In the Vancouver Natural History Society Census of December 26, 1956, the number of starlings counted was 8518. Altogether it was estimated that 14,000 birds were roosting in the area in the winter 1956-57. Roosting was taking place in the 2000 blocks of West 14th and 16th Avenues and at the following properties: 3290 Maple Street, 3333 Cedar Crescent, and 1712 Cedar Crescent, in addition to the places used in previous years (W. M. Hughes, in litt., Nov. 19, 1957). However, in a letter of December 31, 1957 Mr. Hughes tells me that the 1900 block of West 18th Avenue was occupied only during the winter of 1955-56.

Mr. Hughes has sent me the following account of the behaviour of the birds at the Vancouver roosts:

> "The starlings start coming into the roost in small numbers around the second week of November, but do not reach their maximum numbers until the end of December or the first week of January. This year (1957) I was at the roost on November 11, and the starlings were just starting to arrive. Only about 300 were present that evening, and all were in the 1900 block of West 14th Avenue only.
>
> "They arrive at the roosting area about 35 minutes before dark but do not drop into the trees at once. They do a lot of flying around and resting on TV aerials. The last birds go into the trees just about the time the street lights come on. If there is heavy fog the birds do not come to the roost, but I do not know where they then roost during foggy evenings.
>
> "One thing, besides the increase in the population of starlings, that has caused them to spread out over a larger area, was that they had become such a pest as a result of their droppings that several residents in the 1900 block West 14th had the trees removed from in front of their houses. (See Fig. 15.) These trees are 40-45 feet high and the starlings use the upper half of the trees, while the lower branches of the trees are occupied by robins and juncos (Junco oreganus).

Fig. 12. Roosts of the European Starling in the Shaughnessy Heights district of Vancouver, B. C., as of January, 1957 (information received from W. M. Hughes).

"Sharp-shinned (Accipiter striatus) and Cooper's hawks (A. cooperii) have been seen on every visit I have made to the roost, taking both starlings and robins."

TABLE 6

WINTER ROOSTS &

CHRISTMAS BIRD CENSUSES

	1951-52	1952-53	1953-54	1954-55	1955-56	1956-57	1957-58
Vancouver Roost	-	?	500	3000-8000 (?ca. 5000)	8000	14,000	15,500
Censuses:							
Vancouver	-	0	-	2741	7631	8518	14,653
Victoria	3	0	0	392	0	5	0
Vernon	1	0	0	8	16	26	
Comox	0	0	7	7	-	+	
Crescent Beach	0	-	0	0	-	100+	

In the Christmas Census of 1954 in Victoria, only 392 starlings were counted (A. R. Davidson has it as 142, which was the number counted by his party). In 1955 none were counted in the census, and there is no report of any roosting in Victoria. It is evident that fewer starlings are wintering on the southern end of Vancouver Island, around Victoria, than are wintering in the Lower Fraser valley. The rapid increase in numbers and in area of the Vancouver roost is truly remarkable and must surely be a sign of the rapid rise in the breeding population in the interior of the province. The largest number of starlings to be seen at Comox was a flock of about 500 which was seen there in the winter of 1956-57 (Audubon Field Notes 10 No. 1).

Farther up the coast, at Alert Bay (100 miles NW of Comox and 130 miles SW of Kleena Kleene), starlings were observed by W. W. Kennedy, who wrote on February 4, 1957 to the Provincial Museum that "for the past week there has been a flock of birds here" that he believed to be starlings. The description was correct. He tells me (in litt., April 20, 1957) that:

> "the original flock was of roughly 16 birds. A week later the flock had dropped to nine; next week it was seven in number; another week and the flock comprised five birds. This same (?) flock of five birds was seen at intervals of approximately one week until perhaps four weeks ago, but has not been seen since."

(9) Northern Coast

It is doubtful whether there are many localities along the northern coasts where the country has been opened up sufficiently to support any great winter population of starlings. It is rather surprising, however, how many records we have so far, for we have records of starlings all the way from Victoria to Juneau, Alaska. From the region I have designated as the Northern British Columbia coast we have the following reports:

(a) Bella Coola. Two, March, 1947 (Godfrey, 1949, and earlier in this paper). One, Dec. 1, 1948 (Godfrey, 1949, and earlier in this paper).

While he was a Ranger at Ocean Falls, H. B. Hammer (in litt., Nov. 15, 1957) saw single starlings, or at most small flocks, occasionally at the town of Bella Coola during the winter between the years 1952 and 1955.

(b) Ocean Falls. There were five starlings here for some time during the winter 1953-54. Starlings were not seen during the summer (H. B. Hammer, in litt.)

(c) Queen Charlotte City. One, in collection of Provincial Museum (No. 10028) taken February 28, 1952 (Kessel, 1953; G. C. Carl, Director, in litt., June 19, 1956).

Another specimen, taken at the same place, on the same day, is in the collection of R. M. Stewart of Masset, Q.C.I. (see Appendix).

Fig. 13.
West 14th Avenue. View west along north side from 1900 block towards 2000 block and intersection with Maple Street.

Fig. 14.
West 14th Avenue. View east along south side in 1900 block showing (centre) gaps in the line of ornamental conifers caused by starlings forcing residents to cut trees out of their gardens.

Fig. 15.
West 14th Avenue. 1900 block, north side. From right to left: uncut trees, cut trees, and replantings.

Fig. 16.
1712 Cedar Crescent. (corner of Pine Crescent and Pine Street), looking approx. NNW, from south side.

(Photos by M. T. Myres)

Both these specimens were taken by H. B. Hammer (Guiguet, 1952b) who writes (in litt., Nov. 15, 1957) that:

> "The one in the Provincial Museum taken Feb. 28, 1952 in Q.C.I. is one of the two I shot from a flock of six that were wintering there. I presented one to Ronald Stewart and sent the other to the museum. This flock had been frequenting the town of Queen Charlotte City during that winter, and were the first I had ever seen."

Hammer remarks that the Queen Charlotte Islands are some 70 miles from the mainland, though the NE corner is rather closer than that. Mr. Stewart writes from Massett (in litt., Dec. 17, 1956) that:

> "Up to date I've never seen these birds during the breeding season. But have seen them each winter since that date (Feb. 28, 1952). Not many, just one flock of 25-40 birds, and they don't seem to be on the increase as yet."

(d) Prince Rupert. About 50 starlings were seen through the winter from November, 1955, to March, 1956 by Mrs. Clare E. Hitchcock (Prov. Museum records).

(e) Terrace. This town is some 70 miles east of Prince Rupert, but only 35 miles from tidewater at the head of Douglas Channel. The report from this location is negative, since H. B. Hammer (in litt., Nov. 15, 1957) who was there from 1946 to 1948 did not see any starlings there during that period, although they were reported at Bella Coola during this time.

(10) Alaska Panhandle

Strictly this is outside our area, but the fact that starlings have been reported from Juneau, Alaska during the spring is significant for our understanding of future behaviour of the starling in northern British Columbia.

The first record of the starling in the Territory of Alaska was published in an addendum to Kessel's (1953) paper on the starling. This observation concerns a single bird observed in a cow pasture near Juneau airport on April 17, 1952, by Tarleton F. Smith, G. Hilsinger, and L. McDonald.

An unpublished spring record is that of a single bird observed by Mr. R. R. Parker of the Alaska Department of Fish & Game three years later, also in April. The bird was seen at Auke Bay, Fritz Cove Road, 14 miles NW of Juneau on April 12, 1955. It came in with a flock of robins.

These two records are plotted in Figs. 3 and 4. They indicate quite clearly, I believe, how single birds or small groups of starlings may travel northwards (away from their standard NE preferred direction) in spring with flocks of migrant robins or blackbirds, which are not committed to a NE preferred direction. By this means starlings may be carried far to the northwest of the area in which they were raised the previous summer.

It is not, of course, surprising that if starlings are wintering at Prince Rupert or the Queen Charlotte Islands, they should travel farther up the Inside Passage with migrant robins in the spring. Nevertheless, Juneau is some 320 miles from Prince Rupert in a northwesterly direction, in country which, apart from the opportunities provided by human habitations, is not particularly favourable for starlings as far as we know. The possibility exists that, as with the occurrence of the species in northern Alberta and the Northwest Territories (discussed earlier), the starling will in fact establish itself as a breeding species, on a year-by-year basis in such places as Atlin, B. C., Whitehorse and Dawson City, Y.T., and Watson Lake, B. C. The Rev. Father M. Bobillier of Atlin (in litt., June 6, 1956) tells me that he has not identified any starlings so far. But I believe that if a few pairs of starlings pass north up the British Columbia and Alaskan coasts during the spring migration with robins, or winter on the Alaskan coast, they will strike north over the mountains up Portland Canal, Behm Canal, and Unuk River, Stikine River, Taku River, or Lynn Canal, and having bred successfully might take their standard SW migratory direction in the fall, and winter in the vicinity of the meadows around Juneau, returning next spring to breed in the Yukon. There is no reason whatever, apparent at present, why the species may not establish itself in Alaska proper and even find its way back into Asia across Bering Strait, or along the Aleutian and Kurile Island Chains. Moreover, birds breeding in central Alaska could find wintering areas in the Alaska Peninsula.

As this review goes to press I have been informed by Tarleton F. Smith (in litt., Dec. 2, 1957) that starlings are now wintering on the coast of SE Alaska. He writes, "I have seen starlings in SE Alaska on at least four different occasions since

the first time at Juneau in 1952, always in small flocks." Two, at least, of these four records are winter observations made at Petersburg about 205 miles NW of Prince Rupert, B. C., and about 115 miles from Juneau: four starlings in December, 1956, at Petersburg, and seven on November 16, 1957, at Point Agassiz, eight miles N of Petersburg (see Fig. 4). Petersburg is well north of any known breeding location in British Columbia, but is on a bearing WSW from breeding areas in northern Alberta, at Keg River and Fort Chipewyan.

FUTURE STATUS OF THE STARLING

I have discussed, above and earlier, the likely future status of the starling in the various regions of British Columbia. I have discussed in the Introduction the behaviour of the population size in becoming reduced to a lower level after the first invasion of a new breeding area in numbers. In Fig. 17, the areas used for breeding by the starling (as shown in Fig. 4) are indicated in

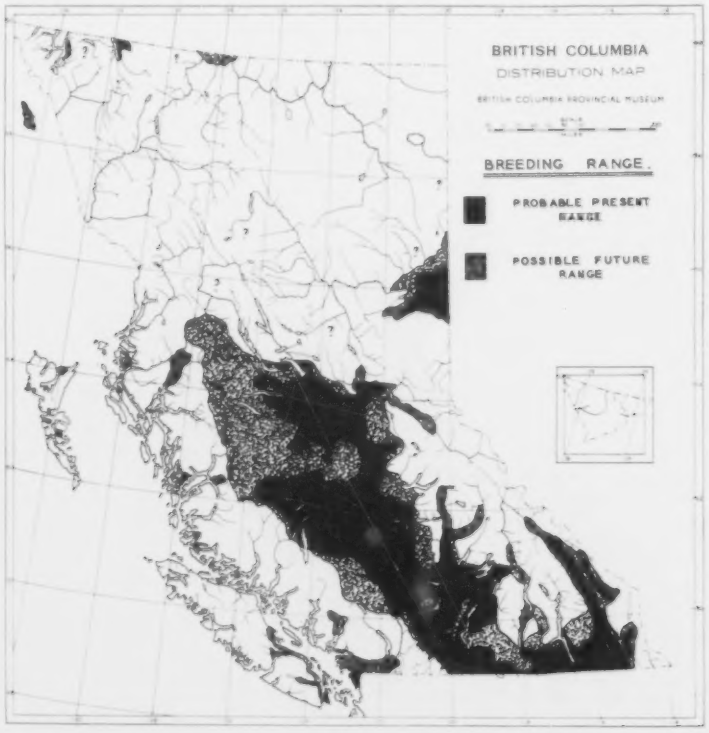

Fig. 17. Present, and predicted likely, breeding range of the European Starling in British Columbia.

solid black, along with some other areas, such as the Nicola country, extreme southern Chilcotin, and "Lakes District" in which breeding is now almost certainly taking place. More marginal regions where breeding may be expected perhaps, in the future, are stippled. Northern British Columbia is a completely unknown quantity. As it is at present most of that area would appear to be unsuitable, and open areas scarce, but the starling has invaded many unlikely boreal forest regions in Canada and most probably will do so also in British Columbia. Our knowledge of this event may well be delayed, however, since few naturalists have been into the northern regions of the province, or into northern Chilcotin, and it will be some years before the human population of these regions achieves any great size.

Fig. 17 is not based on complete evidence but is, rather, an attempt to predict the future.

It is earnestly to be hoped that future observations of starlings in northern British Columbia, the Peace River country, northern Rocky Mountains, northern Chilcotin, North Thompson valley, Arrow Lakes country, Nicola country, and northern coast will be reported fully by naturalists making them, in future issues of Murrelet or Canadian Field-Naturalist, so that we may follow the spread of the bird to the limits of its breeding range. Nesting records in the southern coastal regions should similarly be documented.

It should go without saying that all sight, specimen, and breeding records in the Yukon and in Alaska in the next few years should be published in suitable ornithological journals.

SUMMARY

A documentation is presented of the observations of the European starling (Sturnus vulgaris) in British Columbia. The species, it is shown, could not have occurred in British Columbia, except as a rare vagrant, much before 1944, since it was scarce in Alberta before that time, and it was no commoner in the Pacific states. The first authentic record of the species dates from the winter of 1946-47, and breeding was first reported in 1948. By February, 1950, the bird had been observed over almost as wide an area as it has occupied subsequently, and there is the presumption that early observations in the fall at Bella Coola and in the Ootsa-Francois Lake district were of birds which had originated in the Peace River country.

At the present time, only ten years later, the starling is a common breeding species in the Dry Forest Biotic areas of the Okanagan valley and the southern Rocky Mountain Trench, and in the open parklands of the interior plateau (Cariboo, southern Chilcotin, and probably the "Lakes District" of the northern Chilcotin). It is also likely to be a fairly abundant breeding species in the extensive grasslands which centre on Nicola Lake. In the undeveloped cordilleran areas north of Prince George it is at the present time a straggler only, so far as we know, but it is expected that eventually breeding colonies may be established near, and perhaps even away from, human habitation in the Yukon.

The population of the starling has probably not yet reached its maximum in the southern interior of British Columbia, but it is expected to do so during the next decade, after which it will probably fall to a level at which its effects on orchard agriculture may not be too serious.

The starling has been slow to breed in the coastal belt, two breeding records from Victoria (and one from Blaine, Wash.) being the only ones. This is partly owing to the migratory habits of the bird which delays breeding, in particular on the edge of the Pacific Ocean. The majority of the birds breeding in the interior of the province winter in the Lower Fraser and on the southern end of Vancouver Island. In Vancouver a winter roost has been established in a localized area, which probably numbers close to 15,000 birds at the present time.

There has been one banding recovery in British Columbia, which follows the usual pattern of indicating a preferred SSW to WSW direction of fall migration.

Winter roosting in the interior, on a very small scale, may have begun since 1955, and may be expected (as on the prairies) to increase in extent in future.

The starling can be a serious nuisance to man when in large numbers it invades fruit orchards in the late summer, or roosts in winter in ornamental trees or amenity woodlands, or on public buildings. There is no satisfactory way of preventing this inherent behaviour. I have not heard of depredations on fruit orchards in British Columbia. There is, however, one report of damage to sweet corn, and the bird has caused many sleepless nights in the Shaughnessy Heights district of Vancouver. Some residents there have been compelled to cut down the coniferous

trees in their gardens. As regards general agriculture, the starling has been shown to be beneficial in the eastern United States, owing to its insectivorous diet in summer.

APPENDIX

STARLINGS COLLECTED IN BRITISH COLUMBIA

	Collection & No.	Date taken	Place taken	Sex	Age	Remarks
1.	Provincial Museum (Mount)	Jan. 15, 1947	Oliver	?	?	taken by A. J. Braun (Munro & Cowan, 1947; G. C. Carl in litt.)
2 & 3.	Braun (Mounts)	Jan. 15, 1947	Oliver	1M; 1F	?	Braun (in litt.)
4.	Jobin No. 306	April 30, 1948	Onward Ranch, 150-Mile, Cariboo Road	M	Ad.	Racey (1950); Jobin (1952)
5.	Jobin No. 426	Nov. 26, 1948	Williams Lake	F	Ad.	Racey (1950); Jobin (1952)
6.	National Museum No. 33406	ca. Dec. 1, 1948	Bella Coola	F	Ad.	found by Dr. J. E. Whiting (Godfrey, 1949; and in litt.)
7.	U.B.C. No. 2227	Nov., 1949	Ootsa Lake	M	?	"donator"? (J. C. Shelford in fact); prep. by C. J. Guiguet
8.	Johnstone No. 374	March 8, 1950	Canal Flats	F	-	Johnstone (in litt.)
9.	Jobin No. 1029 (No longer in coll.)	Nov. 3, 1950	Alkali Lake	M	Ad.	Jobin (in litt.); given to Williams Lake High School
10.	Jobin No. 1128	April 6, 1951 (not April 26)	Williams Lake	M	Ad.	Jobin (1952 & in litt.)

	Collection & No.		Date taken	Place taken	Sex	Age	Remarks
11 & 12.	Malfet	---	April 15, 1951	Williams Lake	1M;1F	-	Malfet (in litt.)
13.	Jobin.	No. 1308	Sept. 6, 1951	Williams Lake	M	Ad.	Jobin (in litt.)
14.	Jobin	no number	Sept. 6, 1951	149-Mile, Cariboo Road	M	Ad.	Jobin (in litt.); given to Williams Lake High School
15.	Jobin	No. 1311	Oct. 21, 1951	Horsefly	M	Ad.	taken by Jack Wynstra (Jobin, in litt.)
16.	Jobin	No. 1313	Oct. 21, 1951	nr. Kleena Kleene	F	Ad.	Jobin (1952); Paul (1958)
17.	Provincial Museum	No. 10028	Feb. 28, 1952	Queen Charlotte City	M	-	taken by H. B. Hammer (Kessel, 1953; G. C. Carl, in litt.)
18.	Stewart	---	Feb. 28, 1952	Queen Charlotte City	F	-	taken by H. B. Hammer (Hammer, in litt.; Stewart, in litt.)
19.	Jobin	No. 1381	June 23, 1952	Williams Lake	M	Juv.	Still being fed by parents (Jobin, in litt.)
20.	Martin	---	April 7, 1953	Sullivan Valley, nr. Kamloops	M	-	Martin (in litt.)
21.	Hartman	---	May 6, 1953	Fraser Lake	-	-	found by F. H. Hartman prep. by A. Langley; Hartman (pers. comm.)

	Collection & No.		Date taken	Place taken	Sex	Age	Remarks
22.	Provincial Museum No. 10073		June 5, 1953	Cadboro Bay, V.I.	F	Ad.	taken by C. J. Guiguet; breeding; (G. C. Carl & M. Ball, in litt.)
23.	U.B.C.	1 egg	June 17, 1953	Enderby or Grindrod			collected by J. Wynne
24.	Jobin	No. 1659	Sept. 10, 1953	Williams Lake	M	Juv.	Jobin (in litt.)
25.	Munro	---	Sept. 18, 1953	Nulki Lake	F	Imm.	Munro (in litt.)
26.	Munro	---	Sept. 21, 1953	Nulki Lake	M	Ad.	Munro (in litt.)
27, 28, 29.	Munro	---	Sept. 21, 1953	Nulki Lake	2M;1F	Imm.	Munro (in litt.)
30.	Munro	---	Sept. 26, 1953	Nulki Lake	M	Ad.	Munro (in litt.)
31.	Malfet	---	Oct. 11, 1953	Lac la Hache	F	-	Malfet (in litt.)
32.	U.B.C.	No. 3125	Jan. 16, 1954	Fraser Lake	-	Ad.	found by F. H. Hartman prep. K. Racey
33.	U.B.C.	clutch of 5 eggs	May 6, 1954	Enderby or Grindrod			collected by J. Wynne
34.	U.B.C.	No. 7043	May 13, 1954	Enderby	F	Ad.	collected by J. Wynne
35.	U.B.C.	No. 4479	May 14, 1954	Lac du Bois, Kamloops	F	Ad.	Brood patch, taken by I. McT. Cowan

	Collection & No.		Date taken	Place taken	Sex	Age	Remarks
36.	U.B.C.	No. 7042	May 26, 1954	Enderby	F	Ad.	collected by J. Wynne
37.	U.B.C.	No. 7041	July 25, 1954	Enderby	F	Juv.	collected by J. Wynne
38.	Munro	---	May 27, 1956	Creston	F	Ad.	Breeding, Munro (in litt.)
39.	Munro	---	July 11, 1956	Creston	M	Juv.	Munro (in litt.)
40 & 41.	U.B.C.	Nos. 8189 -8190	Nov. 19, 1956	Boundary Bay, Ladner	1M;1F	-	taken by L. Malfet

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ADDENDA

Additional Records Received Since this Paper Went to Press

The James Grant Collection (Vernon): The only specimen in Mr. Grant's collection is a female, taken at the junction of the White and Kootenay Rivers in October, 1951. This is mentioned in the text.

Winter records from Interior B. C. (1957-58): J. Grant reports that a flock of 120-140 starlings wintered at Vernon this year. There may have been other smaller flocks also. Mr. Glen McInnes reports (in litt., Feb. 4, 1958) that a party of 5-10 starlings wintered in Osoyoos this winter. The winter has been remarkably mild.

Spring migrants (1958): Patrick W. Martin saw the first migrants of 1958 at Kamloops on February 10, 1958 (a flock of five birds). It is conceivable, of course, that these had been wintering in the vicinity, or in the Okanagan. But they may have come from the coast.

Additional Alaska records: Tarleton F. Smith reports (in litt., Jan. 30, 1958) that he has seen starlings again this winter near Petersburg, Alaska. On January 5, 1958, a flock of about 30 were seen, and on January 30, 1958, a flock of about 15 were seen.

Kootenay Region records (1956): W. E. Godfrey (in litt., Dec. 31, 1957) reports that in 1956 he saw one starling at Balfour, at the mouth of the West Arm of Kootenay Lake on June 30. On July 6, a week later, he observed two starlings at Baynes Lake, close to the Kootenay River about 30 miles downstream (south) from Cranbrook.

Winter Roosts in Vancouver, B. C.

Mr. W. M. Hughes of Vancouver reports that:

(a) to his knowledge the Vancouver roost has not expanded this year,
(b) the 1900 block West 18th Ave. was only utilized in 1954-55,
(c) on some nights, even when it is not foggy, starlings do not come to the roost at all.

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